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SCIENTIFIC INFORMATION REPORT  
CHINESE SCIENCE  
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SCIENTIFIC INFORMATION REPORT

Chinese Science (25)

This is a serialized report consisting of unevaluated information prepared as abstracts, summaries, and translations from recent publications of the Sino-Soviet Bloc countries. Individual items are unclassified unless otherwise indicated.

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BIOLOGICAL AND AGRICULTURAL SCIENCES

BIOLOGICAL CONTROL OF INSECTS BEGUN IN CHINA -- Peiping, Kuang-ming Jih-pao, 25 Mar 63, p 1

Experiments conducted by the Institute of Zoology of the Chinese Academy of Sciences on the biological control of insects have produced results. Experiments on the Sunching (Su-yun-chin: 5685/7189/6855) bacillus, introduced into China [from West Germany], proves that it can kill the green caterpillar, the pine caterpillar, the Yang-t'ien-she (2799/1131/4357) moth, and the destructive Lin-ch'ih-mu (7673/5041/4158) insect. Agricultural and forestry departments have begun to conduct experiments along the same line. Entomologist Liu Ch'ung-lo (0491/1504/2887), who is especially interested in this type of research, has said that the use of microorganisms to kill insects is a new thing in China and that such an achievement is a very good advance in plant protection work.

Sunching bacillus is a parasitic virus which can live within the body of an insect. It was first discovered by the German Zoopathologist Pao-lin-na (2672/2651/4780) [Berliner] who found it in the infected larva of the Mediterranean fen-ming (4720/5820), which he came across in a granary in Sunching, Germany. Besides the gemma of the bacillus there appeared a rhombic, satellite vitreous body containing toxin. After the bacteria becomes a parasite in the insect's body, the intestine of the insect is poisoned, and destroyed by the vitreous body, causing juan-fu [lit. soft-rot] (6516/5201) paralysis, after which septicemia develops, which soon causes death.

In the four years since 1958, when the bacillus was introduced into China, personnel of the Institute of Zoology have been continuously carrying out research. They have found a few effective methods of application and culture techniques. Experiments conducted both in the laboratory and outside prove that this bacillus is most effective in controlling the Lin-ch'ih-mu insect and is effective in controlling the green caterpillar, the cabbage moth, the pine caterpillar, the corn borer, and the yellow butterfly. In 1961, institute personnel conducted experiments at the Szu-chi-ch'ing People's Commune in Peiping.

They applied this bacillus to green caterpillars on cabbage and found the death rate to be higher than 90 percent. Recently, institute personnel at the National Pine Caterpillar Central Research Station in Yu Hsien, Hunan, and scientists and technicians of the Forestry Department cooperated in spraying a part of Ma-wei Pine Forest with this bacillus, with the result that 80-90 percent of the caterpillars were killed. Recently, the Academy of Forestry Sciences and the Fukien Institute of Forestry began experiments on a large scale. Kiangsi and Hunan have experimented with Sunching bacillus to kill the camellia caterpillar. The Honan Department of Agriculture and Forestry has used it to control the Yang-t'ien-she moth. The Kwangtung Institute

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of Cabbage has used it to control the cabbage borer. All these experiments had positive results. In the past few months, personnel of the Institute of Zoology have been conducting laboratory experiments on the difficult-to-control army worm and have concluded that neither insecticides nor this bacillus is very effective in controlling the insect. They discovered, however, that a spray made up of low concentrations of 666 and this bacillus was 90 percent or more effective.

Workers engaged in this research say that the use of this bacillus to control and destroy insects has many good features. In the first place, its scope of application is quite broad. Usually microorganisms can kill only a few kinds of insects whereas Sunching bacillus can kill many. According to experiments conducted in foreign countries it not only kills forest insects but kills domestic insects. If mixed with the feed of cattle and chickens, it comes in contact with the eggs deposited by the insects in the manure, and thus very few reach maturity. The equipment used for bacterial spray is relatively simple: ordinary spraying equipment can be used. Owing to the short period of the parasitic insect disease, insects can be eliminated rather quickly. Generally, the Lin-ch'ih-mu larva does not live past the fourth day after it has become infected, the shortest period being only a few hours. Secondly, Sunching bacillus can, under dry conditions, be stored for 10 years without losing its effectiveness. In agar-agar culture its potency can be preserved for 25 years; dried kinds, 45 years. Thirdly, finding a suitable culture is rather easy. Research personnel do not use glucose or teptone. They use inexpensive products such as army ant larva and a substance made from the intestines of pigs, hogs, and sheep, which cultures bacilli which are up to standard. Hunan Bacterial Fertilizer Plant used waste liquor of corn, which produced 300 million spores per gram. The plant has mastered the techniques of this process. Fourth, Sunching is not harmful to man or beast and can be applied to vegetables just before harvesting, whereas poisonous chemicals cannot. It has no poisonous effect on bees and beneficial insects such as the ladybug and parasitic wasps. The silkworm is easy prey to this bacillus, but antibiotics such as tetramycin and streptomycin can be used to protect and preserve the silkworm.

SOUTHWEST AGRICULTURAL COLLEGE MAKES GAINS IN PROTECTING CROPS FROM DISEASE AND INSECT DAMAGE -- Peiping, Kuang-ming Jih-pao, 4 Apr 63, p 2

The Plant Protection Department of Southwest Agricultural College has made definite progress in controlling the principal diseases and insects in Szechwan -- namely, the paddy rice borer, rice blast, and the wheat aphid. This department has submitted its views on general control, which are based on disease resistant varieties, cultivation, and chemical control. In doing research on the wheat aphid, it ascertained that seedling wheat and mature wheat in the Chungking area were both subject to damage by the wheat

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aphid, and that the "ch'ang-kuan" (7022/4619) aphid and the millet aphid both attack the mature wheat and are the principal cause for the reduction in wheat output. As a result of this research, this department furnished scientific data to amend this year's Szechwan wheat aphid control program. As a result of an investigation by this department, it was decided that there were several important research objectives to be carried out on behalf of the province. They were research projects on the broad bean curculio, the potato tuber worm (*Gnorimoschena operculella*) and citrus canker. And it promptly submitted its opinions on protective regulations to concerned departments. The Plant Protection Department united with agricultural departments in carrying out a general investigation of diseases, insects, and weeds on behalf of Chungking and Chiang-ching Special District, and assisted agricultural departments in compiling a written checklist of important crop damaging insects in Szechwan. In integrating agricultural activities, the department started to look into school courses regarding rules governing the growth and development of important diseases and insects. Within the past few years, it has issued some 260 reports on diseases and insects and played the role of a sentinel post for their control. Department teachers further assisted some hsien, special districts, and people's communes to establish measurement reports stations. Since 1958, the department has trained more than 800 plant protection technicians for Chiang-ching Special District and Chungking.

INTERVIEW WITH PROFESSOR CHIN SHAN-PAO -- Canton, Chung-kuo Hsin-wen,  
11 Mar 63, p 7

Prof Chin Shan-pao (6855/0810/1405), prominent wheat specialist, vice-chairman of the board of directors of the Chinese Agricultural Society, vice-president of the Chinese Academy of Agricultural Sciences, and National People's Congress delegate, is currently engaged in wheat hybridization. One of his current projects is to improve and perfect a variety of wheat, "Nung-ta 2419," a famous variety which he developed. "Nung-ta 2419" is an improved variety of wheat which he selectively bred in the preliberation period from 1,800 strains of British P'ao-shih (3382/3044) World wheat. Before the liberation, there was little opportunity for wide distribution of this new variety, but after the liberation, it received universal distribution. Now it is planted in most of the provinces, the total area in which it is planted being 70 million mou. Professor Chin believes, however, that it is not sufficiently resistant to stem rust and *Gibberella* and must be made more resistant. A few years ago, China published Chung-kuo Hsiao-mai Ts'ai-p'ei Hsueh (The Cultivation of Wheat in China), a valuable contribution to agricultural science. This book was compiled under the personal supervision of Professor Chin.



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BOOK ON BUMPER WHEAT OUTPUT PUBLISHED -- Peking, Kuang-ming Jih-pao,  
29 Mar 63, p 1

Hsiao-mai Feng-ch'an Wen-t'i Yen-chiu (Research on the Problem of Bumper Wheat Output), the 4th of a collection of reprinted material on agricultural bumper crop research, published by the Science Publishers and edited by the Editorial Committee on Agricultural Bumper Crop Research of the Chinese Academy of Sciences, is a supplement to, and expansion of, a book entitled Hsiao-mai Mi-chih Ho Shen-keng (Dense Planting and Deep Flowing of Wheat). It also summarizes peasant experience during the 2 years of 1960 and 1961, and it summarizes experimental analysis obtained by large farms in contrast to tests in experimental laboratories. The material for the book was collected and compiled by the Institute of Plant Physiology, the Institute of Pedology, the Northwest Institute of Biology and Pedology, and the Institute of Botany, all of the Chinese Academy of Sciences.

The book consists of 4 chapters and some 150,000 characters. The first chapter, entitled "The Dynamics of the growth and Development of Wheat to Produce Abundantly," is based on the results of radioisotope research on the substance translocation relationship between the main stem and tillers and explains the mutual relationship between tillers and the main stem. The agricultural production level being what it is, the authors maintain that the main stem must be relied on principally but that efforts to produce tillers when it is appropriate are permissible. These methods, accompanied by the benefits of water and fertilizers, continuously raise the level of cultivation. The percentage tillers contribute to production volume may make an appropriate increase. Concerning rational dense planting, the book also inquired into such questions as the development of the flowers and ears of wheat and rational colony construction.

The second chapter, entitled "The Light Energy Utilization and Substance Distribution of Wheat," presents the proofs for the physiological features of wheat photosynthesis and wheat colony photosynthesis based on the analytical measurements made in different localities and in different laboratories. This chapter also supplies scientific data for reasonable dense planting and for watering and fertilizing programs to control plant colony optical energy utilization and nutriment translocation.

The third chapter, entitled "The Relationship of the Nutriment Supply and Demand of Wheat and its Regulation," discusses several principal problems, such as the application of fertilizer at different times of the year and other important problems that must be examined, based on the nutriment accumulation characteristics of wheat and the circumstances of nutriment supply by the soil.

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The last chapter, on "The Relationship Between Wheat and Moisture," makes a preliminary analysis of the effects of irrigation and its physiological role. This chapter also presents the irrigation principle of rapid expansion and restriction in accordance with the soil conditions in different localities and the condition of the plant itself.

INCREASED PRODUCTION PER UNIT OF AREA FROM POINT OF VIEW OF LIGHT ENERGY --  
Peiping, Kuang-ming Jih-pao, 20 Mar 63, p 1

At a conference convened recently by the Institute of Hydrobiology of the Chinese Academy of Sciences, Assistant Director T'ang P'ei-sung (3282/0160/2646) of the Institute of Botany of the Chinese Academy of Sciences made a report on increasing unit-area production from the viewpoint of utilization efficiency of light energy by plants. He said that the utilization efficiency of light energy by plants is conducted by photosynthesis. Under general conditions, the efficiency of photosynthesis is about 20 percent, but in practice this is not reached because of limiting factors: (1) Concerning the absorption rate of light energy by plants, with sun-loving plants it is 80 percent and 20 percent is reflected off, but with shade-loving plants it is 60 to 70 percent. (2) Under general conditions, photosynthesis is slow in weak light and rapid in strong light. If light is intensified to a certain point, the speed of photosynthesis ceases to increase. This point is known as the point of saturation. Quantum efficiency before the point of saturation is large, but after the point of saturation it is reduced. This is an important limiting factor.

He suggested certain possible problems relating to increased production per unit of area. He maintained that, if the utilization efficiency of photosynthesis is 20 percent, and reckoning saturation at 20 percent, then the utilization rate of light energy is only about 4 percent. Reckoned thus, theoretically, and under present conditions, the economic production of paddy rice probably would be 2,000 chin and the biological production, 4,000 chin; for wheat, the economic production would probably be 1,100 chin and the biological production, 3,400 chin. Theoretically, there are some latent forces in production. The problem rests on the fact that there must be a step-up in technical programs and an appropriate increase in the nitrogen content of rice plants. At the present time, however, to accomplish this one point presents definite difficulties. Another method is to break through the 4 percent utilization efficiency of light energy. Reckoning paddy rice at 1,000 chin per mou, the light energy utilization rate from the viewpoint of economic production is equivalent to 0.96 percent and biological production reaches 1.9 percent. Reckoning wheat at 800 chin, the utilization rate of light energy from the viewpoint of economic production is 0.84 percent and the biological production reaches 2.7 percent. Both are below 4 percent, so there is some potential for development. Professor Chin, also spoke on the question of ways to increase the rate of photosynthesis, to increase production output per unit of area.

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PROGRESS MADE IN CROSSING WHEAT AND RYE -- Peking, Kuang-ming Jih-pao, 12 Mar 63, p 1

Pao Wen-k'uei (7637/2429/1145) and his assistant Yen Yu-jui (0917/5148/3843), who have been conducting research on wheat and rye over the past several years, have achieved certain new results. Tso-wu Hsueh-pao (Crop Journal), a quarterly, published an article on "Genetics on the Crossability of Wheat and Rye," which discusses in depth the polyploid method and which is based on research just completed.

Rye possesses many excellent features: it has the ability to withstand a poor environment, is resistant to lodging, to powdery mildew, possesses numerous small ears, has a strong tendency to tiller, and flourishes. To combine its characteristics with wheat to form wheat-rye amounts to a new way of inquiring into wheat breeding. But because the crossing ratio between wheat and rye is low, it is not easy to obtain wheat and rye crosses with different hereditary features; and because of this, this work had been left in the experimental stage up to the present.

To quickly solve the problem of creating, on a large scale, a wheat-rye line, Pao Wen-k'uei, working with the principle of polyploid breeding, did experimental cross breeding and measured the crossing rate of consecutive generations. His 6 years of research from 1956-1962 made clear the genetic laws governing the crossability of wheat and rye. He proposed a method of crossing  $F_1$  or  $F_2$  wheat with rye, which is effective and increases the crossing rate. Using this method, the two men created more than 700 varieties of wheat possessing various horticultural characteristics. To further promote this work, they have furnished a great deal of original reference material.

CHINESE AGRICULTURISTS PRODUCE NEW CROP VARIETIES -- Moscow, Pravda, 23 Mar 63, p 1

The modernization of China's agricultural program over the next 20-25 years will require qualified specialists.

Many young workers of the Kirin Provincial Academy of Agricultural Sciences are conducting independent scientific experiments. Li Kung-te, director of the Institute of Selection, has produced, with the aid of a group of comrades, three new highly-productive kinds of sorghum. With his assistance, scientific coworkers Li Wei-yueh, Hsieh Tao-hung, and others, have produced several kinds of foxtail millet and corn.

The young scientist-horticulturists Ku Mu, Ho Ning, and their comrades produced 11 frost-resistant types of apple trees and grapevines. Ku Mu is writing a large treatise on apple trees in the northeast.

In the southern province of Kwangtung, the number of young coworkers in the local agricultural academy has doubled as compared with the 1958 membership.

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CONFERENCE ON METHODS OF SUGAR BEET CULTURE -- Peiping, Kuangming Jih-pao, 1 Apr 63, p 1

At a conference convened recently by the Harbin Society of Agriculture on sugar beet culture and improved reproduction techniques, some of those present believed that mass selection is an effective way to solve current problems on varieties. Because this method can produce a large quantity of seed and because it is fast, it can determine the variety urgently required in present production, and in the process good ecological material can be isolated. Others attending the conference maintained that enough culture material had already been accumulated and that was no need for further mass selection, and that both systematic selection and hybridization should be carried out. Still others maintained that introduction and domestication are effective methods.

The problem of triploid single variety (tan-li-chung: 0830/4721/4467) culture route was enthusiastically debated. Some were of the opinion that triploid single variety culture should not be developed because triploid types depend on the  $F_1$  generation's category of excellence, because of the large investment in men and material and the complexity of seed propagation work, because cultural techniques are difficult to control, because the germination rate of single variety types is low, and also because the sugar content of such types is low. Others were of the opinion that, if technical conditions are comparatively good, triploid single variety culture should be developed because triploid single variety sugar beets bring large economic returns. At present large areas are sown in sugar beets and such a route should not be disregarded because, in terms of the long view, sugar beet production will achieve mechanization.

A third view expressed was that, within the realm of sugar beet culture, diploid multivariety sugar beet culture should be considered the principal one and that triploid single variety culture should be considered supplementary. The discussion was followed by an expression of uniformity: in accordance with over-all conditions in various localities, appropriate routes should be adopted as the circumstances permit. As for culture methods, uniformity can not be urged but it should be applied in accordance with the level of production assets and technology.

KIANGSU BRANCH OF CHINESE ACADEMY OF AGRICULTURAL SCIENCES EXPANDS RESEARCH -- Peiping, Kuang-ming Jih-pao, 24 Mar 63, p 1

Research personnel of the Kiangsu Branch of the Chinese Academy of Agricultural Sciences are currently engaged in rapidly expanding research activities, closely related to agricultural production.

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Lin Yu (2651/6735), a paddy rice borer specialist, just back from a lecture tour in Anhwei Province, told newspaper reporters that last year, Kiangsu Province saved 700 million chin of rice from destruction by paddy rice borers, but that large numbers of borers still await destruction. He said that to solve current, critical research problems, it is necessary to seek more labor-saving, economical, and effective control measures and chemicals, at the same time engaging in research to improve cultivation techniques and reduce borer damage. Under his leadership, the paddy rice borer laboratory recently engaged in research on the physiological and ecological changes in the borer during the wintering-over period and on the causes of the death of the borer from 666. At the same time, they prepared a popular report on control of *Schoenobius incertellus* in accordance with requirements of the Chinese Society of Entomology, to assist concerned units in drawing wall charts and act as an aid in revising film commentary on borer control. These personnel will soon go to the Pei-lo-hsia Ho area to make investigations and assist in local research.

In the experimental fields outside the laboratory many researchers are busily engaged on a number of projects. Commenting on the borer, one researcher said that the larva winters over in the "hothouse" of the rice roots. To understand the effects of temperature changes on the borer's growth and development so that predictions can be made about its emergence, researchers normally go to the fields to take measurements. At present, it is getting warmer, and they will begin to take frequent measurement.

Ch'en Yung-k'ang (7115/3057/1660), born a peasant and an outstanding paddy rice researcher, is currently engaged in processing rice seed which he crossbred last year. He and T'ang Yu-hent (3282/3768/1649), a paddy rice cultivation specialist, are writing a summation of the first stage of a research project conducted by Ch'en's bumper crop research team. T'ang, an important member of this team, has worked with Ch'en for 2 years. This year, he will go to the Su-chau area to establish a research base and give demonstrations of Ch'en's experiments.

Growing outside the academy's hothouse are various kinds of crops: paddy rice, cotton, and sweet potatoes -- to name a few. Researchers are cultivating, examining new sprouts of recently sown seed, selecting wild rice seed for experimentation, and inoculating wheat leaves and stems with rust virus. One researcher dusting sweet potato plants said that these plants would soon make seed and that the seed would be sown outside the hothouse. This fall, the crossbred tubers will be harvested. He said that the experiment would be continued inside the hothouse to save time so that the results of research can more quickly serve agricultural production.

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The temperature in the hothouse is maintained at 25 degrees centigrade throughout the year. One researcher, analyzing the effects of humidity on the pink bollworm, said that it is the most destructive cotton insect in Kiangsu. At present, the principal way to control the pink bollworm during the winter and spring months is to spray the larva in the stored cotton. Insecticides commonly used must come in contact with the insect's body before they can kill it. Recently, these researchers found a new insecticide which kills the insect if fumigation methods are used. Experimental results were good. They plan to go to Nan-t'ung area at the end of this month to conduct more tests.

The researchers at the Kiangsu branch academy make sure they adopt integrated research methods for the experimental hothouse, experimental farms, and rural bases so that research work and local agricultural production are brought even closer together. Researchers are continually leaving the academy for the bases to make investigations. So far this year, one third of the personnel have left at one time or another. Chao Shou-jen (6392/1343/0088), head of the efflorescent saline soil improvement team, recently went to the Hsu-huai area to select a spot for a research base, and at present he plans to go again to conduct an investigation. Lin Hsing-ch'ien (5259/5887/0467) told reporters that they recently completed six articles on the utilization of improved efflorescent saline soil and will forward them to concerned departments for their examination and used as reference material.

NANKING AGRICULTURAL COLLEGE DEVELOPS RESEARCH -- Peiping, Kuang-ming Jih-pao, 24 Mar 63, p 1

This year, Nanking Agricultural College plans to carry out more than 140 projects, most of which have already begun.

Since September of last year when the Tenth Party Plenum issued an appeal to increase scientific and technological research, especially in agriculture, the college has done much preparatory work to strengthen its scientific research for the current year. The college research office has coordinated efforts with the chairman of the various departments, and inspects research conducted by most of the teaching and research sections. It has summarized experiences for instruction and appraised the results of research. It also has extensively solicited ideas for the development of scientific research in the future, and it has helped some sections to determine a firm research program and complete their research tasks for this year and the past few years.

To insure the successful development of research work, the college paid special attention to "rear service" work and in many areas created conditions to satisfy the requirements of research. At the end of the semester, it began to reorganize agricultural and animal husbandry

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practice farms and defined two agricultural farms in the college as scientific research bases. These two farms have already arranged their work in detail for the current year and have allocated three times as much land as heretofore for experimentation. The college has assigned technological workers with agricultural production experience to important research projects. Besides reducing the teaching duties of the older teachers and letting them have more young help, the college has reassigned some 40 young teachers to assist the older teachers in their research work.

This year, the college has 54 key research projects, an increase of more than one third over last year. The majority of the new research projects this year are concerned with tasks proposed by the government and are important agricultural production problems in Kiangsu; for example, the project proposed by the Pedology and Agrochemical Department for the utilization and improvement of the soil in the low-lying fields of the Li-hsia Ho area in Kiangsu Agricultural Department and Water Conservancy Department, the Kiangsu Branch of the Chinese Academy of Agricultural Sciences, and other units, expressed support for this project, which got under way in early March.

Some of the projects undertaken by the Nanking Agricultural College this year were carried out on a continuing basis for the past several years. The Plant Protection Department began research on paddy rice white leaf disease in 1955 and has reached some conclusions on the cause and prevention of the disease. This year it strengthened experimentation in bacteriophage and isotopes to further understand contagious rice diseases and the spread of viruses among rice seedlings, as well as effective methods of chemical control. The Agricultural Department, in the past few years, has continuously made steady increases in output of wheat on some 6,000 mou of land. Unit area output was double that of local farms. The department is continuing to do research on nitrogenous nutrients and water distribution to ensure steady bumper wheat crops on large areas under given local conditions such as soil, weather, and the state of mechanization.

RURAL BASES ESTABLISHED BY SHENSI BRANCH OF CHINESE ACADEMY OF AGRICULTURAL SCIENCES A SUCCESS -- Peiping, Kuang-ming Jih-pao, 18 Mar 63, p 1

The research bases established in the villages by the Shensi Branch of the Chinese Academy of Agricultural Sciences have been an effective experiment for the past 10 years. Party Branch Secretary Liu Tso-cheng (0491/0146/0015) said that the research bases have done valuable advanced work in many places, and the experiments of the last 10 years have made the benefits derived from integrating the research programs of laboratories, experimental farms, and rural bases quite evident. Since 1953, the Shensi Branch of the Chinese Academy of Agricultural

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Sciences (the former Northwest Institute of Agricultural Sciences) has established 62 research bases in 31 hsien on the Kuan-chung [Shensi] Plains, in northern Shensi, and in southern Shensi. The 300 or more scientific workers in the academy and researchers in the laboratories and on experimental farms go to these bases regularly to conduct research. Their travels take them throughout the entire province including the loess plateau, the desert areas, and the Ch'in-ling mountain area.

In 1958, the branch academy established a base in the Kuan-chung rape center to assist the Yung-an Production Team of the Lin-chun People's Commune, Yung-chou Hsien. After adopting the program proposed by the academy, this production team increased its output and won the provincial red banner for bumper rape crops. At present, this program is in use throughout the Kuan-chung area. A researcher stationed at the Wu-kung base analyzed the traditional experience of the peasants regarding crop rotation and crop arrangement and submitted views to further advance crop rotation, which views were based on the integration of planting, soil utilization, and cultivation in accordance with the quality of the soil. His views received the attention of leading departments in Shensi and were promoted everywhere. In 1958, the Soil and Fertilizer Institute of the branch academy experimented successfully with senna as a green manure crop for wheat, but when the senna was planted on a village base, it did not readily germinate. The institute renewed its research with regard to sowing time and cultivation techniques, which subsequently proved successful in practice. These procedures were then promoted in the Kuan-chung villages.

In 1954, winter wheat in the mountainous areas began to die out on a large scale. Many research workers believed that this was the result of the cold climate and planned to experiment by advancing the sowing date. But after the research base examined it, it was discovered that the trouble was caused by red nanism. It is said that if the rural research bases were not consulted, research by the laboratories and experimental farms would get further and further away from actual practice. The rural research bases supply scientific workers with an unending number of research topics. Since 1958, they have submitted 166 important topics for research, have made 55 summaries of bumper crop experience regarding wheat, corn, cotton, and other important crops, and have written more than 90 important scientific articles. Scientific workers on the bases constantly pay attention to the common scientific knowledge of peasants, develop scientific talent in the villages, and assist the peasants in carrying out research activities.



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ANWHEI ATTEMPTS TO INTRODUCE EUCALYPTUS IN PROVINCE -- Peiping, Kuang-ming Jih-pao, 29 Mar 63, p 2

An eucalyptus tree, a tree which normally grows in tropical and subtropical areas, has become established in Ho-fei, Anwei Province. This tree, which is being cultivated by Anwei Agricultural College, has already gone through five winters with temperatures as low as 6.9 -- 9.2 degrees below zero centigrade. The year before last it had two buds, and last year, eight. Of the eight, two flowered and produced seed.

The eucalyptus is of considerable economic value. According to literature on the subject, each hectare (equivalent to 15 shih-mou) of 20 year old trees can produce 800 cubic meters of lumber, enough to make 5,200 railroad ties -- that is, the number required to lay 3.5 kilometers of railroad. Eucalyptus is water repellent, can resist not comparatively well, and does not require processing. It can be used for mine supports, railroad ties, bridges, and wharves. The tree was introduced into China more than 70 years ago. Since the liberation several units have been doing research in an attempt to grow the tree in the north.

To carry on reproduction work, Anwei Agricultural College each year must obtain seed from Fukien, Kuangtung, and Yunnan. Ch'en-Chen-ku (7115/7201/0657), a young instructor of the Department of Forestry and Communist party member, who has been doing research on the tree since 1958, wondered if it could be reproduced asexually. He consulted reference materials and performed several slipping experiments, none of which has been successful enough for practical use. He improved on the method of slipping by taking part of the bark of the mother tree along with the slip with the result that 70-80 percent of the slips lived. [This item is accompanied by a photograph of the eucalyptus tree that has survived 5 winters in Ho-fei, Anwei Province.]

HEILUNGKIANG ACADEMY OF FORESTRY STUDIES EFFECTS OF PROTECTIVE FOREST BELTS -- Peiping, Kuang-ming Jih-pao, 1 Apr 63, p 1

Scientific and technological workers of the Heilungkiang Academy of Forestry have made a preliminary summary of improved natural and climatic conditions on the farms in the western part of the province to expedite increased production in agriculture. They discussed improved types of forest belt construction, reasonable use of trees, and other problems. They supplied reference material for future afforestation work to promote increased agricultural production.

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The protective forest belt in the western part of Heilungkiang began to be established in 1954. It is an important part of the Manchurian Protective Forest Belt which runs through the western part of the north-east and the eastern part of Inner Mongolia. The part which was established early, which encompasses 19 hsien including Kan-nan, Su-yu, and T'ai-lai, is now a dense forest, most of which has begun to play a role in increased agricultural production. In the 4 years since 1959, the Academy, along with the Nen-chiang Institute of Forestry, Chiu-san Farm, and the T'ai-lai and Lung-chiang bureaus of forestry, has been carrying out systematic observations of the forest belt to study its good points and shortcomings. They selected a curved belt for comparative studies and made it the standard. They placed instruments and equipment at various points to systematically observe and examine the coefficient of permeability to air, wind velocity, soil temperature and humidity, air temperature, and soil percolation, as well as crop growth and increased production, as affected by the protective forest belt.

Analyzing the reference material accumulated during the past 4 years, the scientific and technological workers concluded that forest belts play a good role in expediting increased agricultural production with regard to the improvement of micro-climate. In the first place, protective forests reduce wind velocity, reduce changes in the quantity of heat, and serve as a good regulator of air temperature, and in general advance the timing of various crops. Wheat for example can be sown on the 5th of July in areas protected by the forest belt but can not be sown until the 10th of July in areas not protected. At the same depth, the temperature of the plowed layer of soil in protected areas is about 2 degrees centigrade higher than that in areas not protected. Moreover, variations in temperature between night and day are smaller, which is favorable to the normal growth and development of crops. The humidity of the soil in protected areas averages 11.2 percent higher than that in nonprotected areas, and moisture evaporation is 10-20 percent less. According to the investigations of Chiu-san farm, crops in the protected area average 22.57 percent higher than those in unprotected areas, the highest increase being 27.4 percent. T'ai-lai Hsien's records show that yields are up 20 percent in protected areas.

Scientific and technological workers believe that protective forest belts can and do promote increased agricultural production on a large scale. That the belts occupy cultivable land is an objective fact, but it is worthwhile. For example, consider a primary belt 15 meters wide and 400 meters long and a secondary belt 10 meters wide and 1,000 meters long, which would protect an area of 43 hectares. The land occupied by the belt and the flank land would be 3.24 hectares. The land thus used, that is, land on which crops cannot be grown, is 8.1 percent, but the remainder, 91.9 percent, can be used for increased production. If increased production averages 20 percent, and the land occupied by the

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belt and the flank is subtracted, the increase in production is still 10.28 percent over that of nonprotected areas. At the same time, the scientific workers believe that when it comes to planning and establishing protective forest belts, the utmost should be done to keep the use of cultivable land at a minimum. They also discussed in detail the lack of protective forest belts at the present time and integrated this with practical conditions. Concerning such problem as tree selection and forest belt construction, they submitted views and proposals to further improve afforestation work. Existing forest belts consist principally of willow, elm, and tamarisk, which grow rapidly but which are subject to disease and insect damage and are short-lived. They proposed that certain evergreens be selected. These are long-lived and subject to relatively little disease and insect damage.

ARTICLE PUBLISHED ON P'O-YANG LAKESHORE VEGETATION AND LAND UTILIZATION --  
Peiping, Kuang-ming Jih-pao, 23 Mar 63, p 1

An article entitled "P'o-yang Lakeshore Vegetation and Land Utilization" appeared in the Kiangsi Jih-pao 14 March 1963. It inquired into the nature of the various plant colonies of the P'o-yang Lakeshore, the laws governing their distribution, and the question of land utilization.

The author, Huang Hsin-ho (7806/2450/0735), claimed that the climate of P'o-yang Lake, which is located in the subtropical part of China, is excellent, that the lakeshore area is extensive, that many kinds of plant colonies thrive there, and that the special features of these colonies and the natural environment which regulates their distribution are completely uniform. For example, because the lake fields store up water all year long, aeration varies, the soil is mostly marshy, and there is a vast distribution of lotus and aquatic grass colonies. Among the latter, edible plants and pasture grasses are unusually lush all year around. Thus the lake fields are suitable for the development of animal husbandry. In this comparatively high, wild area, the land can be cultivated and paddy rice, wheat, legumes, rape, and radishes can be grown. The grass banks bordering the lake are slightly higher than the lake fields, and the soil is comparatively heavy and uniform. It supports a dense growth of herbage: for example, moss, reeds, rushes, and peat, which can be used for compost or fuel and to make field sheds. These plants all have massive root systems which serve to hold water and soil in place. The grass bank vegetation makes excellent forage for cattle and sheep, but attention must be given to the practice of rotating pastures and letting the land lie fallow. The grass banks, which are 16 meters above sea level, are suitable for the cultivation of many crops. In addition, the P'o-yang Lake area has large areas of stony hills, which principally supports a growth of wild temper (*Vitex trifolia*) and centipedegrass (*Eremochloa orphiuroides*). Of the many

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plants that grew in this area several are the source of drugs; for example, wild pepper and artemisia. And there is the famous *Lespedeza bicolor*, an excellent green manure. These plants which live on the stony hills can endure drought and thrive in hard sand.

The author maintains that extensive research on the mutual relations between vegetation and environment will make it possible to correctly master the laws governing the vegetation distribution of lake fields, grass banks, and stony hills. He also points out that extensive research on the features of vegetation ecology and botany will make it possible to master the dialectical relationship between vegetation growth and development on the one hand and environment on the other. Then, as circumstances permit, vegetation on lake fields, grass banks, and stony hills can be developed. In the stony hill areas, where the brush cannot be controlled advantageously, the soil can be improved so that the latent productivity of the land can be fully developed.

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NORTHWEST AGRICULTURAL COLLEGE TRAINS TECHNICIANS -- Canton, Chung-kuo  
Hsin-wen, 12 Apr 63, p 11

The Northwest Agricultural College was established in Sian in 1933. At the time of the liberation there were only about 500 students in the school, and the whole school consisted of only one main building, three laboratories with very little equipment, and a library of 36,000 volumes.

In the past 14 years, this college has greatly advanced. At present, there are eight departments, including agriculture, horticulture, animal husbandry and veterinary medicine, agricultural economics, and forestry. The number of students has increased fourfold, and the library holdings have increased tenfold.

Since the liberation, the Northwest Agricultural College has trained almost 4,000 graduates. These graduates have been assigned as teachers, research workers, and staff members of tractor stations and agricultural technology stations in Shensi and 15 other provinces and regions.

YUNNAN INSTITUTE OF AGRICULTURAL MACHINERY DESIGNS NEW PLOW -- Peking,  
Kuang-ming Jih-pao, Mar 63, p 2

The Yunnan Institute of Agricultural Machinery, which was established in 1959, has been working on a new type of plow for the past 4 years which will meet the cultivation requirements and soil conditions of Yunnan. During the past 2 years, this plow has been tested in various parts of the province and was everywhere welcomed by the peasants. In 1961, the institute test manufactured more than 300 of this animal drawn No 2 Fa-tzu plow. Since the beginning of 1962, the plow has been further improved through modifications of its plowing depth and width and curve of blade.

TASKS OF AGRICULTURAL EXTENSION STATIONS, ANIMAL HUSBANDRY AND VETERINARY MEDICINE STATIONS -- Peiping, Kung-jen Jih-pao, 7 Apr 63, p 2

The principal tasks of agricultural extension stations are to support the collective economy of the peoples commune, improve agricultural techniques, and develop agricultural production. Its work tasks are: (1) to instruct the masses about new techniques (for example, the use of new types of farm equipment and machinery and agrochemicals and chemical fertilizers) to popularize new culture techniques and new improved varieties of seeds, as well as the selection and retention of seed and the proper handling of such things as storage and sterilization, and to render technical guidance. (2) To render technical guidance with regard to forestry, animal husbandry, the fishing industry, subsidiary production, and water and soil conservation. (3) To advance the eight-character

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constitution of agriculture and disseminate the achievements in agricultural research. (4) To summarize and popularize production increase experience among the local masses. (5) To publicize agricultural information and assist communes and production teams to develop peasant technicians. (6) To assist communes and production teams to conduct research on the special features of local agricultural production, to formulate programs to increase production, and to render technical guidance in the implementation thereof.

Animal husbandry and veterinary medicine stations are the country's basic level technical organs for furnishing technical leadership in developing production in the animal husbandry industry on behalf of the people's communes and production teams. Their tasks are: (1) guide communes and production teams to increase and improve strains of domestic animals and poultry; (2) To guide the communes and production teams in making arrangements for hay and fodder and the reaping and storage thereof and to promote the planting of fodder crops to increase production; (3) To organize and guide, from among the peasants, veterinarians and epidemic control personnel, and to develop domestic animal and poultry epidemic control work; (4) To be responsible for the inspection of stock and meat products, to train animal husbandry and veterinary medicine personnel for the commune and the team, to teach and disseminate new scientific techniques, and to summarize and popularize advanced experience.

STUDY ON TRADITIONAL VETERINARY MEDICINE PUBLISHED -- Peiping, K'o-hsueh T'ung-pao, No 3, Mar 63, p 73

The Institute of Traditional Veterinary Medicine, Chinese Academy of Agricultural Sciences, has compiled the third work in a series on traditional veterinary medicine, Chung Shou-i Ch'en-t'an Hsueh (Diagnostics in Traditional Veterinary Medicine), published by the Agricultural Press. Earlier books in this series include Chung Shou-i Chen-chiu Hsueh (Acupuncture and Moxibustion in Traditional Veterinary Medicine) and Shou'i Chung-yao Hsueh (Traditional Drugs in Veterinary Medicine). The latest book is divided into two sections, one setting forth the theory of traditional veterinary and the second providing specific example of diagnosis using these techniques. This work is another example of the analysis of traditional veterinary medicine with modern scientific techniques.

SCIENTISTS EXPLORE NATURAL RESOURCES IN SOUTHWESTERN CHINA -- Canton, Chung-kuo Hsin-wen, 21 Feb, p 5

Since 1957, the Yunnan Tropical Biological Resources Expedition and the Western Areas Water Resources Expedition of the Chinese Academy of Sciences have carried out investigations of tropical and subtropical

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plant resources in southern Yunnan, and of natural resources in the western part of Szechwan Province and the northern part of Yunnan Province. These two teams have obtained a great deal of data, and have written more than 40 reports totalling about 3 million characters in length.

The scientific workers found rich resources and broad grasslands in the southeastern part of the Tibetan Plateau. The best natural grasslands are in the Kan-tzu and A-pa areas, where grasslands account for 46.3 percent of the total land area. According to the team's report, the direction of development in western Szechwan and northern Yunnan provinces should concentrate on animal husbandry and the development of industrial crops and fodder which are resistant to cold. Forest resources in this area are very rich, and second only to those in the Northeast. The expedition advised that this area be made one of the nation's permanent material bases. The expedition also found large deposits of peat in the No-erh-kai meadow.

According to the investigation of the scientific workers, there is abundant water power in western Szechwan and northern Yunnan Provinces, amounting to about one third that of the whole country. The Chin-sha Chiang, Ya-lung Chiang, Min Chiang, and Ta-tu Ho are all located in gorges, and have high volumes of low and a steep fall, which are advantageous conditions for development. If they are more fully utilized in the future, it will certainly have important effects on the economic development of this area.

SCIENTIFIC WORKERS FIND RICH RESOURCES IN BORDER AREAS -- Canton, Chung-kuo Hsin-wen, 18 Apr 63, pp 5-6

Investigation by scientific workers in recent years have proved that there are exceptionally rich natural resources in China's broad border area. The border areas account for 60 percent or more of China's total land area, and were practically unexplored prior to the liberation period. Teams organized by Institutes of the Chinese Academy of Sciences and other concerned units have explored about 5.7 million square kilometers of area in the northeast, Inner Mongolia, the northwest, the southwest, and south China.

In the course of these explorations, the scientific workers discovered that not only do the border areas have rich natural resources, but they also have good future prospects for the development of agriculture. The results of a comprehensive investigation of the Heilungkiang Basin by scientific workers in geomorphology, weather, flora, soils, water conservancy, agriculture, and fisheries prove that most of these areas are the temperate, moist, and semi-moist areas in which agricultural crops can be grown. Moreover, they have proved that the soil in the plains areas is rich and can support a great many types of crops, fruit trees, and pasture grasses. At the same time, the exploration teams made an initial survey of the forest resources and fish varieties in these areas.

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The result of explorations by several teams all prove that the natural conditions in the Inner Mongolia Autonomous Region and north-western part of China are suitable for the development of agriculture and animal husbandry. The weather in these areas is warm, and sunlight is sufficient; southern Sinkiang has more sunshine than any other part of China, with 3,000 hours or more per year. Northern Sinkiang with its temperate weather, is well-suited to the growth of grains and sugar beets. The major agricultural crops in the Ho-hsi corridor are grains and cotton, and the Chi-lien Shan area is the best suited to the raising of sheep and horses. There are favorable conditions for further development in all of these enterprises.

The result of investigations in Yunnan, South China, indicates that southern Yunnan, Kwangtung, Kwangsi, and even southern Fukien provinces can be considered moist areas of the tropical and southern subtropical belt. These areas are suitable for the raising of various kinds of tropical subtropical industrial crops, and in some places it is possible to have two or three crops per year.

Central Tibet, western Szechwan, and northern Yunnan are all parts of a high, cold belt. The scientific workers felt that because of the cold weather in this area, and the fact that Arable land was broken up into small, widely-scattered parcels, the area is not suitable for large-scale development of agriculture, and should concentrate on the development of animal husbandry. Investigations in desert areas indicate that some desert areas have relatively rich water, soil, biological, and sunlight resources. For instance Dunganian desert of Sinkiang and the Hsiao-t'eng-ko-li desert area of Inner Mongolia are composed mostly of fixed and semifixed sand, and can be made into good winter pasture land.

PROFESSOR PING CHIH ENGAGED IN RESEARCH FOR 50 YEARS -- Peiping, Kuang-ming Jih-pao, 30 Mar 63, p 3

Prof Ping Chih (4426/1807) of the Institute of Zoology of the Chinese Academy of Sciences has been engaged in research for the past 50 years. Today, at 77, he is still occupied with morphological research on vertebrates in an effort to raise the basic theoretical level of zoology in China. Many of the well-known zoologists in China were his students.

[This short item is accompanied by two pictures of Ping Chin with captions as follows:

"At present, Ping Chih is engaged in morphological research on a species of fish to further understand the evolutionary phenomena of higher animals" and Prof Ping Chih and two female research students discuss documents."]



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RADIOACTIVE ISOTOPES USED IN FISHERIES RESEARCH -- Peiping, Pei-ching, Jih-pao, 13 Dec 62, p 1

The Tangtze River Institute of Aquatic Products of the Ministry of Aquatic Products and the Kiangsu Province Institute of Aquatic Products have employed radioisotopes in several experiments, and have obtained results which can be reported. In one experiment, some fingerlings were kept in a solution of radioactive calcium, and some mature fish were placed in a special apparatus which forced the solution containing radioactive calcium directly into their bodies through the skin and gills. Later, the various organs of both the fingerlings and the mature fish were dissected and burned to ashes, after which it was determined what portion of the calcium isotope had penetrated the skin, flesh, skeleton, and blood of the fish in a period of one hour. Since fish require large amounts of calcium to form bones and scales, the results of this experiment will help to promote the growth of fish through the addition of calcium to fish ponds which lack it.

TECHNICAL SCIENCES

CHINESE USE ELECTRONIC COMPUTER IN WEATHER FORECASTING -- Peiping, Jen-min Hua-pao, No 5, May 63, p 7

[The photograph of a computer and its operator bears the following caption: "One of our country's scientific workers in meteorology uses a Chinese-built electronic computer to carry out calculations for weather forecasting". The computer pictured has two sections about equal in size, one of which houses the control console, and is quite similar to the corresponding unit in the Russian model M-3 computer. The other section is attached by a wiring harness to a much smaller unit which may be a type of reader for either magnetic or paper tape.]

THEORETICAL CONFERENCE HELD BY CHINA AUTOMATION SOCIETY -- Peiping, K'o-hsueh T'ung-pao, No 3, Mar 63, p 70

A specialized conference on theory was held by the China Automation Society 21-27 December 1962 in Peiping. Of the 54 papers and reports presented to the conference, 29 were read. These included "A Comprehensive Survey of Pulse Systems," by Hsueh Ching-hsuan (5641/2529/8830); "A Comprehensive Survey of Auto-Adaptive Systems," by Wang Hsin-min (3769/2450/3046) and Lu Ying-hsiang (0712/2019/4382); and "A Comprehensive Survey of Positive Feedback," by Kung Ping-chung (7895/3521/6927).

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Many of the papers read concerned themselves with theoretical concepts related to concrete engineering problems. These included "Selection of Nonlinear Control System Anti-Interference System Parameters and Methods of Calculating Correction Networks," by Ho Kuo-wei (0149/0948/0251), et al., and "Reliability Determination for Single Variable-Element Systems," by Yang Chih-chien (2799/1807/1017).

Some of the papers read at the conference were concerned with basic theoretical research, as in "Synthesis of Variable-Parameter Maximum Speed Systems," by Sung Chien (1345/0256) and Han Ching-ch'ing (7281/0079/3237).

Other papers dealt with the application of new methods of control: "Discussion of an Experiment on Approximate Calculation Methods for Variable-Coefficient Linear-System Optimal Control Installations," by P'eng Kuan-i (1756/0385/0001) and "Applications of the Analog and Feedback-Adaptive Automatic Pilot," by Hsiao Shun-ta (5135/7311/6671).

The China Automation Society also held a plenum conference and called two symposia on teaching automation. In addition, three small groups were formed to work in the fields of (1) engineering calculations, theory, and methods; (2) optimal control and reliability theory; and (3) auto-adaptive control.

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PROBLEM IN PHOTOGRAMMETRIC ORIENTATION DISCUSSED -- Peiping, Ts'e Huei Hsueh-pao, Vol 5, No 3, Sep 62, pp 219-226

[The following is an English abstract appearing in an article, "Determination of Angular Elements in Photogrammetric Orientation," by Chou K'a (0719/0595).]

By utilizing the condition that three lines (one from the first expositional station,  $L_1$ , to the second expositional station,  $L_2$ ; one from  $L_1$  to an image of a ground point, A, on the first photograph,  $L_{1a}$ ; and the other from  $L_2$  to an image of the same ground point on the second photograph,  $L_{2a}$ ) be coplanar, the authors obtained an equation of the form

$$\begin{vmatrix} 1 \tan \theta & \tan \nu \\ x^I & y^I & z^I \\ x^{II} & y^{II} & z^{II} \end{vmatrix} = 0$$

that is,  $w^I \cdot x^{II} = 0$ , where  $w^I = (w_z^I, w_y^I, w_x^I)$ , a row vector and  $x^{II}$  a column vector, provided that the second photograph is oriented in the same coordinate system as the first photograph. This equation can be written as

$$\frac{1}{0} \cdot x_0^{II} + d \frac{1}{0} \cdot x_0^{II} + v \frac{1}{0} \cdot dx^{II} = 0$$

by Taylor's expansion of the first power terms. By using the approximation method, the second photograph's tilt,  $t$ , swing,  $s$ , and the principal plane azimuth,  $\phi$ , and the second expositional station's angular elements,  $\theta$  and  $\nu$ , could be obtained in cases where the first photograph has been absolutely oriented. Proceeding in the same way, the third photo's  $t, s, \phi, \theta$  and  $\nu$  could be determined, and the fourth photograph's, and so on to the last, absolutely oriented. If there have been no numerical errors introduced in the results and propagated in each step, the final results must be the same as the last photograph's. This closure condition gives us one way to treat all the photographs, in one or several strips at once, by solving simultaneous equations. (FOR OFFICIAL USE ONLY)

FIRST NATIONAL CONFERENCE ON RESEARCH IN FRICTION, WEAR, AND LUBRICATION -- Peiping, K'o-hsueh T'ung-pao, No 2, Feb 63, pp 69-70

The Chinese Academy of Sciences and the Chinese Society of Mechanical Engineering held the first national report conference on research in abrasion, wear, and lubrication in Lanchow from 15 to 20 October, 1962. A total of 51 research papers and reports were submitted to the

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conference. Their contents included the recent circumstances and developments, both domestic and foreign, in the subject fields; methods of research in the utilization of modern tools; research in the solution of concrete problems on lubricating materials, bearing design, and bearing materials; and research into the basic theory of lubrication and lubricants.

Liu Ch'eng-lieh (0591/2110/3525) of the Academy of Sciences presented a report on utilization of radioisotopes for research in friction wear in engine parts which can greatly reduce the time required for an experiment (from the usual 500 to 1,000 hours per experiment to as little as 4 to 5 hours), and raise accuracy as much as 50 times. In his report on "[article Abrasion", Ch'en Li (7115/4539) of the Peiping Agricultural Mechanization College presented several cases of damage to agricultural machinery from particle abrasion, and discussed the possibilities of finding abrasion-resistant materials or improving the design of the machinery.

From his work on improving the design of bearings, Wan Ch'ang-sen (5502/7022/2773) of the First Ministry of Machine Building prepared a report on "Calculation of the Load Capacity of a Gas Bearing (Static type)". Wen Shih-chu (3306/6108/6999) of Tsinghua University presented a report on "Experimental Analysis of the Load Capacity of a Bearing Lubricated by Air Under Static Pressure". Hu Shao-i (5170/4801/5902) of the Chinese Academy of Sciences described his work in "The Application of Plastic Laminated Bamboo in the Bearings of Steel Rolling Machinery".

In the area of lubricant research, Yu Yung-chung (0060/3057/1813) of the Chinese Academy of Sciences presented a report on the problem of heat oxidation stability of synthetic silicon oil. In the past, it was believed that the silicon-oxygen bond in silicon oil had a protective effect on the methyl radical, and that the oxidation of silicon oil began with the hydrogen-carbon bond of the methyl radical. On the basis of his work, Yu advanced the theory that oxidation begins with the silicon-carbon link.

MONOGRAPH ON LIGHT PETROLEUM FRACTION PUBLISHED -- Peiping, Chung-kuo Shih-yu Ch'ing Liu-fen-ti Tsu-ch'eng (The Composition of Chinese Petroleum Light Fractions), K'o-hsueh Ch'u-pan She (Science Press), Dec 62, 231 pages

[This 344,000-character monograph was published on the date indicated by the K'o-hsueh Ch'u-pan She; it is being sold for 2.0 yuan through the Hsin-hua Shu-tien (New China Book Stores). In the words of the authors, this work is a collection of the research results on the

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constitution of light fractions of Chinese petroleum; and is intended as a reference book for workers in petroleum sciences and organic chemistry. The preparation of the work was supervised by the party leadership of the Lanchow Branch, Chinese Academy of Sciences, and the Lanchow Institute of Petroleum, Chinese Academy of Sciences. Following is an outline of the contents of this monograph together with the authors responsible for the preparation of the various chapters:

### I. Methods of Studying the Composition of Gasoline Fractions of Petroleum

Chapter 1: Introduction, by Chang Ming-nan (1728/2494/0589) (Institute of Petroleum, Chinese Academy of Sciences). Chang discusses, among other things, the increase in Chinese petroleum production. "Within the short period of the last 10 years, 2.58 million meters of wells have been drilled in China, 86 times as many as the 30,000 meters drilled in the 42 years prior to the liberation.... Massive expansion has been achieved in the old oil fields of Yu-men Tu-shan-tzu and Yen-ch'ang; in addition, a large new oil fields have been developed at Karamai, Tsaidam, and in central Szechwan Province, and over 40 other oil and natural gas fields have been discovered. All this is exclusive of coal and shale oil. In the 42 years prior to the liberation, the total production of crude oil was less than 2.78 million tons; in the last 5 years, crude oil production has risen steadily, reaching 2.25 million tons annual production for 1958 and about 3.70 million tons in 1959...."

"Most of the work," continues the author, "done in studying the constitution of Chinese petroleum has been done at the Institute of Petroleum, Chinese Academy of Sciences, or the Lanchow Branch Institute. In the field of precision fractional distillation, says Chang, we have studied the operational properties of wave-form filler and spiral filler fractioning columns in order to determine the influence of reflux ratio, flow velocity, and the amount of evaporation and residue upon the degree of separation. The only chemical method used is catalytic dehydrogenation. We have studied the conditions for transforming fixed quantities of cyclic hexane hydrocarbons into aromatic hydrocarbons," claims the author. The optimal conditions for the dehydrogenation of cyclic hexanes in gasoline fractions has been determined to be a spatial velocity of 1.8-2.4 liters per hour per liter at 300 degrees. Under these conditions, the transformation rate for cyclic hexanes is 95-99 percent.

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"We use elution for the separation of aromatic hydrocarbons. In the field of combination scattering spectra, all operational conditions and analyses have been found wanting. At one time or another, we have used all of the above methods in analyzing Yu-men gasoline 85-125 degrees platinum-rearranged crude oil, Yu-men oil's K-, and M-layers and oil refinery gasolines, and the simple hydrocarbons of gasoline fractions of the oils from Karamai, Yen-ch'ang and other important Chinese oil fields. These research results are emphasized in this monograph."

In discussing the future trend of petroleum research on physical and physicochemical methods of analysis, Chang stresses the importance of obtaining more high purity hydrocarbons, arguing that while it is a difficult task, it is of great significance in fundamental research and is absolutely essential to the development of petroleum chemistry to measure the physicochemical constants of the pure hydrocarbons. Other areas in which research is needed are said to include coherent refining fractions, accurate preparation of lubricating oils, processing of heavy residual oils, and chemical uses of petroleum; in addition, research on the constitution of petroleum must be closely coordinated with petroleum geology research.

Chapter 2: Precision Fractions, by Yang Chen-yu (2799/2182/1342) (Institute of Petroleum, Chinese Academy of Sciences). This chapter includes sections on basic principles and an evaluation of various types of fractionation columns.

Chapter 3: Liquid-Solid Spectra, by Yang Chen-yu. This chapter include sections on basic principles and on spectral separation of direct-fraction gasoline aromatic hydrocarbons.

Chapter 4: Catalytic Dehydrogenation Analysis of Cyclic Hexanes, by Ch'en Ju-hsi (7115/3067/3556) (Institute of Petroleum, Chinese Academy of Sciences). This chapter includes a discussion of experiments on secondary reactions of various hydrocarbons and analysis of cyclic hexanes in known mixtures.

Chapter 5: Combination Scattering Spectra, by Hsu Wen-chun (1776/2429/0193) (Institute of Petroleum, Chinese Academy of Sciences); This chapter deals with instruments and apparatus, and the selection of operational conditions.

Chapter 6: Determination of Physical Constants, by Hou Ch'i-hsien (0186/0120/6343).

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II. The Constitution of Simple Hydrocarbons of Gasoline Fractions of Chinese Petroleum

Chapter 7: Flow Analysis and Crude Oil Division, by Hou Ch'i-hsien.

Chapter 8: Analysis of Gaseous Hydrocarbons and Light Fractions, by Wang Wen-yen (3769/2429/4291).

Chapter 9: The Isolation and Analysis of Aromatic Hydrocarbons, by Wang Wen-yen. This chapter includes sections of silicon rubber pretreatment and determination of its aromatic hydrocarbon content, liquid-solid spectral isolation of aromatic hydrocarbons, the E-fraction, and silicon rubber recovery.

Chapter 10: The Isolation and Analysis of Cyclic Hexanes, by Hou Ch'i-hsien. This chapter contains sections treating of the apparatus for catalytic dehydrogenation, preparation of the catalysts, and the isolation and analysis of the aromatic hydrocarbons in dehydrogenated products.

Chapter 11: Alkane and Cyclic Pentane Fractions, by Yang Chen-yu. This chapter includes discussions of filler preparation, fractionating column preparation, and the operational process of fractioning.

Chapter 12: Spectral Analysis, by Hsu Wen-chun.

Chapter 13: The Simple Hydrocarbon Constitution of Gasoline Fractions of Important Chinese Petroleum, by Chang Ming-nan and Ch'en Ju-hsi.

Appendix: The Spectra and Physicochemical Properties of Simple Hydrocarbons of Sub-160 Degree Gasoline Fractions, by Ch'en Ju-hsi and Liu Ch'ing-jung (0491/1987/2837).] (FOR OFFICIAL USE ONLY)

ACCOMPLISHMENTS OF CHINESE STANDARDIZATION AND MEASUREMENT WORK --  
Peiping, Kuang-ming Jih-pao, 5 May 63, p 1

Materials supplied to the National Standardization and Measurement Work Conference held recently in Peiping indicates that standardization and measurement work is occupying an increasingly important position in the national economy. The conference expressed the hope that all concerned departments throughout the country will strengthen their leadership and management and make standardization and measurement work service industrial and agricultural production and scientific research even better.

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According to the impressions of many delegates at the conference, standardization work advanced rapidly during the Second Five Year Plan. At present, there are a total of more than 7,300 technical standards specified either nationally or by one of the production departments. This number represents a twofold increase over the end of the First Five Year Plan. The thorough implementation of these standards has had a great effect on improving quality, increasing the types of product, and saving various types of materials. After the forestry industry and the railway departments revised the technical standards for sleepers in accordance with conditions in China, not only was there a further guarantee on the quality and effective life of the sleepers, but it has also resulted in the saving of almost 200,000 cubic meters of timber in the four years since the standards were revised. In addition, the standardization of parts for more than 20 types of alarm clocks manufactured in China has made it possible for the factories to concentrate their efforts on improving quality and production of these parts, and has resulted in a reduction of one third in the amount of copper materials used.

China has also been advancing unceasingly in measurement work. According to impressions from this current conference, the number and accuracy of China's present standards for measuring length, heat, force, and electromagnetism satisfy all of the basic requirements of present industrial production. With the exception of Tibet and Tsinghai, the other 28 provinces, municipalities, and autonomous regions in China have all established measurement agencies. After the Chungking Water Pump Plant improved its system of inspecting and setting the measurement instruments used in production, the size of parts produced became more accurate, and the assembly of a water pump at present is three times as fast as it was in the past.

Although China has accomplished a great deal in standardization and measurement work, there was practically no work done in these two fields before the liberation, so the foundation is still very weak. Delegates to the current conference unanimously called for greater efforts in this area, to meet the requirements of modernization of agriculture, modernization of industry, modernization of national defense, and modernization of science and technology.

FIRST GRADUATES OF CORRESPONDENCE COURSE IN INDUSTRIAL, CIVIL AND ARCHITECTURAL ENGINEERING -- Peiping, Kuang-ming Jih-pao, 8 Mar 63, p 2

The first group of 57 graduates of the industrial, civil, and architectural engineering correspondence class of Hunan University will soon be finishing their courses. Most of these graduates have received excellent grades in the 6 years of diligent self-education in which 23 special required courses and work projects for graduation have been written).



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This group of graduates has been enrolled since 1956. Under individual tutelage, an excellent arrangement, they were able to fully utilize their spare time for work and study. With the use of textbooks written by professors, they received instructions and studied hard. For example, Ts'ai Chang-keng (5591/7022/6342) in Canton, was able to complete more than 1,000 mathematical exercises in two courses of "higher mathematics" and "material dynamics," although he was unable to attend classes in person. As result of learning through correspondence, the level of work performance was elevated; some students were promoted from technicians to engineers and assistant engineers. Lo Shih-ying (5012/0013/5391) a worker of the Planning Department of the Ministry of Coal Industry, became a model worker in Wu-han by virtue of being able to combine his theoretical knowledge and production experiences since 1961 to design a reinforced concrete scaffold for mine shafts, in place of the usual fabricated steel scaffold. His plan is to substitute the steel beam that is usually used with a continuous reinforced concrete beam designed to withstand a predetermined stress. Such a design will be able to save a definite amount of steel.

Since 14 October 1962, 35 students of this class were permitted to come to the university to work out their graduation project. By 12 January of this year, they had already completed the basic work of their graduation projects; by working part time and designing part time these individuals all completed their projects by 28 February. As planned by the university, a strict achievement test was conducted by a 16-man examination board consisting of the president, dean, professors and instructors of Hu-nan University as well as well-known experts in the departments of civil and architectural engineering and technology of Hunan Province. All of their projects received commendations from the examination board.

PEIPING INDUSTRIAL STUDENTS DO GRADUATE PRACTICE -- Peiping, Kuang-ming Jih-pao, 23 Mar 63, p 1

Many students of this year's graduating class in higher level industrial schools in Peiping are now engaged in graduate practice in factories, mines, rural people's communes, and state-operated farms, or with geological prospecting teams. The number of students and practice positions this year is larger than it has been in the past few years. Some 1,200 students from the Peiping Iron and Steel Industries College have been dispatched to 49 factories in 15 provinces and municipalities. Agricultural electrification specialists of the Peiping Chemical Engineering College and the Peiping Construction Industry College both established in 1958, and the Peiping College of Agricultural Mechanization, catalytic organic synthesis specialists of Peiping Petroleum Industries College, and industrial electrification specialists of Peiping Electric Power College are, for the first time, doing graduate practice this year.

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In general, graduate practice takes from 6 to 8 weeks. After the students arrive at the production unit, they not only make an addition to the labor force but spend the principal part of the time in examining and compiling material for graduate theses and graduate designs. After they arrive at the factory or at the village they do complex preparatory work and determine the topic of their graduate theses and designs under the guidance of their instructors. The majority of students choose a practical problem emphasizing theory or in the category of research. The students very much appreciate this opportunity to come into contact with production practices. Besides paying attention to the strict requirements of the task they are involved in and actively acquiring on-the-spot practical knowledge, they sincerely study the excellent virtues of advanced workers and model agricultural workers and raise the level of their own political awareness. Regarding their study time, in general they devote about half a day per month to the study of political affairs. The colleges prepare the instructors to participate in graduate practice. Among them are instructors with many years of teaching experience. Professors and assistant professors also participate.

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CHEMISTRY AND CHEMICAL TECHNOLOGY

FURTHER RESEARCH ON SEPARATION OF SCANDIUM AND THORIUM -- Peiping, Hua-hsueh Hsueh-pao, Vol 28, No 3, Jun 62, pp 139-147

[The following is an English abstract appearing in an article, "The Separation and Determination of Scandium and Thorium III. Tetrachlorophthalic Acid as a Reagent," by Liang Shu-ch'uan (2733/2885/2930) and Hung Shui-chieh (3163/3055/4105), both of the Institute of Chemistry, Chinese Academy of Sciences. The authors acknowledge the assistance of Li I-yu (2621/0044/7183) with the experimental work. This item was received for publication in September 1961; the two previous parts of this article appeared on pages 12 and 100, respectively, of Volume 28 (1962) of this journal.]

This paper reports the use of tetrachlorophthalic acid as a precipitant of scandium. The solution acidity found suitable for precipitation was pH 2.4-4.4. Each gram-atom of scandium requires 2.5-3 moles of precipitant; no adverse effects are evident up to eight of precipitant. The range of determination was 1-102 milligrams (mg) of scandium oxide.

This paper also presents the thermolysis curves of the scandium and thorium salts of tetrachlorophthalic acid; there is a plateau in the scandium salt curve between 80 and 150 degrees centigrade; the constitution of this scandium salt is demonstrated by analysis to be  $C_6Cl_4(COO)_2 \cdot Sc(OH) \cdot H_2O$ . Another plateau (the formation of scandium oxide) was evident between 670 and 960 degrees centigrade (no measurements were taken higher than 960 degrees). The thermolysis curve of the thorium salts was similar in form to that of the scandium salts; two plateaus were formed, one between 80 and 150 degrees centigrade and one between 720 and 960 degrees centigrade. These denote, respectively, the formation of  $[C_6Cl_4(COO)_2]_2 \cdot Th \cdot 3H_2O$  and thorium oxide. Both salts are in a form suitable for weighing after being dried at 120 degrees centigrade.

This paper further reports on the effects of various anions and alkalis as well as upon the conditions for the separation of rare-earth elements. No interference is encountered in twice precipitating light rare-earth elements even after a 100-fold increase, or yttrium after a 10-fold increase. Precipitation of the rare-earth elements with tetrachlorophthalic acid is at a minimum (0.3-2 mg of oxides at pH 2.5-3.4). Furthermore, a method was devised for the determination of scandium and thorium; precipitate thorium twice with a pH 1.0-1.1 and again precipitate the thorium after filtering and adjusting to pH at 3.0. The weight ratios of scandium oxide to thorium oxide of 1:2.5 to 1:9.7 were tested with good results; the absolute error was in the range 0.0 to  $\pm$  0.7 mg thorium dioxide and  $\pm$  0.1 to  $\pm$  0.3 mg scandium oxide. (FOR OFFICIAL USE ONLY)

SOLUBILITY OF FUSED SLATS IN LIQUID METALS RELATED TO SURFACE TENSION  
 -- Peiping, K'o-hsueh T'ung-pao, No 3, Mar 63, pp 68-69

[The following is a summary of an article, "The Solubility of Fused Salts in Liquid Metals," by Ch'en Nien-i (7115/1819/6318) and Chang Kuei-ch'eng (1728/2710/2052). It was read as a paper at the First National Conference on Physical Chemistry in Metallurgical Processes held in December 1962, according to a footnote.]

In this paper the authors describe the relationship that they found to exist between the solubility of various chlorine salts in liquid metals and the surface tensions. The theory they propose is based on the work of Uhlig (H.H. Uhlig, *Journal of Physical Chemistry*, Vol 41 [1937], p 1215) and Johnson (G. W. Johnston et al., *Phil. Mag.*, Vol 44 [1959], p 963). The authors derive a formula for the solubility equilibrium constant of the salt's vapor in liquid metal:

$$\ln K' = \frac{-4 \pi r^2 N \sigma}{RT} + \frac{\Delta E_A/n}{R} + \frac{\Delta S}{R}$$

in which K' is the constant, r is the radius of the intermolecular holes,  $\sigma$  is the surface tension of the liquid,  $\Delta E_A$  is the energy expended by the interaction of the fluid with the incoming molecules, N is the total number of molecules, n is the number of chlorine ions, R is derived from the Maxwell-Boltzmann distribution law, T is the absolute temperature, and  $\Delta S$  is the change in entropy during the dissolution of the salt's vapor.

Log K' was calculated from the solubilities of  $CsCl-Cs$ ,  $RbCl-Rb$ ,  $KCl-K$ ,  $NaCl-Na$ ,  $BiCl_3-Bi$ ,  $PbCl_2-Pb$ ,  $Hg_2Cl_2-Hg$ , and  $MgCl_2-Mg$  at temperatures of 500, 600, and 700 degrees centigrade. The measurements on the lead and magnesium systems were made by the authors, the others were based on the figures of other authors.

On the basis of their calculations, the authors point out that the chlorine material's solubility is very low when the metal's surface tension is 410 dynes/cm or larger and that the solubility of the chlorine compound is fairly high when the metal has a fairly low surface tension.

MATHEMATICAL AND PHYSICAL SCIENCES

STRANGE PARTICLE PRODUCTION AND INTERACTION DISCUSSED -- Peiping, Wu-li Hsueh-pao, Vol 18, No 7, Jul 62, pp 333-378

[The following is a full translation of the Chinese abstract, accompanying the article, "Strange Particles of Strong Interactions," by Ting Ta-chao (0002/1129/6856), Wang Chu-hsiang (3769/4376/5046), and Wang Kan-ch'ang (3769/3227/2490). The article was received for publication 15 March 1962.]

This paper discusses, in summary fashion, the present situation in experimental work on the strange particles produced by the  $\pi$ -p, p-p,  $\bar{p}$ -p, and gamma-N reactions and the interaction of these strange particles with the nucleus. It continues and supplements an earlier article, " $\pi$ -N,  $\bar{p}$ -N, and p-N Interactions at Energies Below Ten Bev" by (Wang Kanch'ang and Wang Chu-hsiang, in Wu'li Hsueh-pao, Volume 17, 1961, p 520). This article includes the latest experimental results on strange particle production and reaction.

The data on strange particles produced by the  $\pi$ -p reaction and the interaction of these particles with nucleaus is prominently discussed. The phenomena occuring in the threshold energy region during the  $\pi$ -p reaction are distinguished from those occuring in the high-energy region; variations in cross-sections and angular distributions with energy as well as polarization during the production process are discussed. The amplitudes are analyzed and a few actual examples are provided from recent results. Some simplified induction is performed for the strange particles produced by p-p,  $\bar{p}$ -p, and gamma-N reactions for which there is a scarcity of experimental numerical data.

As regards the interaction of strange particles with other particles, the total cross section, the elastic and inelastic scattering, and the different resonance states for K-N reactions are discussed. The angular distribution of the differential cross section for elastic scattering was studied. The authors observed several types of inelastic scattering processes and branching ratios. The two different explanations proposed for the important phenomena of the resonance states of lambda and pi mesons are provided. Finally, some additional problems are raised, particularly as regards ways of viewing the  $K\bar{K}\pi\pi$  reaction. The authors argue that this reaction may be the central problem of the production and interaction of strange particles.

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COUPLED WAVE GUIDE THEORY DEVELOPED Peiping, Wu-li Hsueh-pao, No 7, Jul 62, pp 324-333

[The following is an abstract of an article, "A Generalized Theory of Coupled Local Normal Modes in Multiwave Guides," by Huang Hung-chia (7806/1347/0857). According to a footnote, important parts of this paper appeared in English in Scientia Sinica, January 1960, and the mathematical part appeared in Shu-hsueh Hsueh-pao, September 1961; the physical section has not previously appeared.]

In this paper a generalized theory of coupled local normal modes is developed; it is based on the mathematical method, "method of slowly varying coefficients," introduced by the author in a previous paper ("Method of Slowly Varying Coefficients," Shu-hsueh Hsueh-pao, Vol 11, No 3, pp 328-247). The set of ordinary coupled wave equations is transformed by this method into a new set of equations for the local normal modes with much-reduced couplings. To illustrate the applicability of the method, the all-important problem to bend with slowly varying curvature is solved by considering two and three coupled modes successively. For the two coupled-modes case, our results agree with those of Louisell ("Analysis of the Single Tapered Modes Coupler," B. S. T. J., July 1955, pp 853-870) and Unger ("Normal Mode Bends for Circular Electric Waves," B. S. T. J., September 1957, pp 1292-1307). Solution for the three coupled modes problem has not hitherto appeared in the literature. A numerical evaluation of the spurious modes in an S-shaped bend is given. Further applications are discussed.

RESISTANCE NETWORK ANALOGUE -- Peiping, Wu-li Hsueh-pao (Acta Physica Sinica), Vol 18, No 12, Dec 62, pp 657-669

[The following is an English abstract appearing at the end of an article, "A Resistance Network Analogue for Magnetic Field with Both Axial and Plane Symmetry," by Hsin-chieh (1823/6343/2638). Ts'ao Chia-lin (2580/1367/7792), and Wu Ts'ai-te (0702/2088/1795). Additional data contained in the source are also given below.]

In this paper the principle of simulating an axial and plane symmetrical magnetic field by a resistance network analogue is analyzed. The method of current injection has also been discussed and the formula for the second order approximation was given. Based on the above principle, a resistance network analogue with associated apparatus was constructed. The central part of the work contains 10 x 14 units. It is extended by end strips to 28 and 32 units in z and r directions respectively. Experiments have been done with this network for several types of field, which

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have precise solutions analytically. Errors of the network under various conditions were noted and their origin traced. Experience shows that the analogue is reliable. It shortens considerably the time required for the design of many complex magnetic configurations.

In writing this paper, which was submitted for publication on 18 June 1962, the authors used 12 English references dated 1945-1956 and one Chinese reference dated 1957 by a Russian author.

TEXT ON DIFFERENTIAL EQUATION STABILITY THEORY PUBLISHED -- Shanghai, Ch'ang Wei-fen Fang-ch'eng Wen-ting-hsing Li-lun (Stability Theory of Ordinary Differential Equations), Shanghai Science and Technology Press, Jun 62, 399 pp

A monograph, Ch'ang Wei-fen Fang-ch'eng Wen-ting-hsing Li-lun, by Hsu Sung-ch'ing (6079/3247/1907), 302,000 characters in length was published by the Shanghai Science and Technology Press in June 1962. According to its author, this book, which may be used as a supplementary text or reference work in higher schools or by engineers, consists of a systematic introduction of the Lyapunov Method No 2 in the theory stability. In addition, this work is said to present some of the more important research results of the past decade or so in this field.

The 89 entries in the bibliography consist of 78 in Russian, of which 4 have been translated into Chinese; 4 in English, of which 1 has been translated; 1 in German; and 6 in Chinese. Five of the 6 Chinese entries are credited to Hu Chin-ch'ang (5170/6855/2490), Ho Ch'un-chin (6320/2504/6930), and the author of the present work, all of whom are affiliated with Chungshan University; the other Chinese author is Ch'in Yuan-hsun (4440/0337/8113).

FUTAN UNIVERSITY PUBLISHEDS MATHEMATICAL PAPERS -- Shanghai, Shu-hsueh Lun-wen Chi (Mathematical Treatises), Shanghai Science and Technology Press, May 60, 488 pp

[The Mathematics Department, Fudan University, offers a work, Shu-hsueh Lun-wen Chi, originally published in May 1960 by the Shanghai Science and Technology Press, and re-issued in March 1962. This work, 564,000 characters in length, is said to be intended as a research reference work for higher schools and engineering units. It is a collection of 54 mathematical papers prepared by the faculty and students of the Mathematics Department of Fudan University from October 1959 to May 1960. These papers include treatises addressed to the solution of practical production problems, research on mathematical aspects of large-scale

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engineering projects, and some advanced basic theoretical research, it is said. The following are some of the papers presented in this collection; the authors of the papers mentioned below seem to be members of the faculty rather than students.]

The Nonlinear Differential Equation Section contributed "The Problem of Discontinuous Initial Values for Sets of Canonical Hyperbolic Equations" and "The Problem of Plane Supersonic Peak Diffraction Flow." Ku Ch'ao-hao (6253/6389/6275) contributed "On Irreducible First-Order Isotropic Groups of Infinite Continuous Pseudo-Groups." Hu Ho-sheng (5170/0735/3932) contributed "On the Reducibility of Lie-Cartan Transformation QuasiGroups." Hsia Tao-hang (1115/6670/5887) and Yen Shao-tsung (0017/4801/1350) offered the paper "On the Distribution of Conjugate Space in Hilbert Space;" Hsia also coauthored, with Wu Cho-jen (0702/0587/0086) and Chang Wen-ch'uan (1728/2429/3123), a paper entitled "Multiement Conditions in the Determination of Generalized Functions." Chang and Wu collaborated on another paper, "The Paley-Wiener Theorem of Generalized Functions in Quantum Field Theory."

METHODS OF SOLVING TORSION EQUATIONS FOR ANISOTROPIC PLATES DISCUSSED  
-- Shanghai, Shu-shueh Lun-ven Chi (Mathematical Treatises), Shanghai Science and Technology press, May 60, 488 pp

[The following is an abstract of an article, "Several Methods of Solution for Heterogeneous Vertical Anisotropic Plate Torsion Equations," by the 1956-1961 class specializing in nonlinear equations on pp 71-122. This class acknowledge the direction of experienced instructor Ku Ch'ao-hao (6253/6389/6275) and the suggestions of experienced instructors Hsia Tao-hang (1115/6670/5887) and Hsu Cheng-fan (6079/2398/5400); all of the above are of the Mathematics Department, Fudan University.]

This paper discusses several methods of solving heterogeneous vertical anisotropic plate torsion equations. These methods are effective for all types of border conditions of extended variable-parametric fourth-order elliptical equations. This paper first sums up these equations and presents boundary conditions under various circumstances. The authors then suggest two ways of treating parametric difficulties encountered in the parametric equations. The paper then presents the application of the generalized variation method to nonrepeating harmonic fourth-order constant-coefficient elliptical equations; the various boundary problems of the anisotropic plates are solved and examples of practical applications are given.



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[Two of the entries cited in the bibliography are coauthored by Shu Te-chien (5289/1795/1017) and Shih Chen-tung (2457/2182/2639): "Generalized Variable Principles of Thin Elastic Plates and Their Application" and "Use of Generalized Variable Principles of Thin Elastic Plates in the Solution of Several Equilibrium Problems for Complex Boundary Conditions of Rectangular Plates;" these articles both appeared, respectively, in Pei-ching Hang-h'ung Hsueh-yuan Hsueh-pao (Peiping Aviation College Journal) No 1, 1957, and No 2, 1957.]

SOLUTION OF QUASI-HYPERBOLIC EQUATIONS DISCUSSED -- Shanghai, Shu-hsueh Lun-wen Chi (Mathematical Treatises), Shanghai Science and Technology Press, May 60, 488 pp

[The following is an abstract of an article, "A Discussion of an Integral Solution for a Set of Quasi-Hyperbolic Equations in the Absence of Shock Waves," by the Nonlinear Differential Equation Section, Mathematics Department, Fudan University.]

This paper treats the problem of at what time do sets of canonical hyperbolic equations fail to give rise to discontinuous solutions. A sufficient condition was found for the nondevelopment of a discontinuous solution of the Cauchy problem. These sets of equations are applicable in aerodynamics, hydrodynamics, soil mechanics, nonlinear elastic and plastic dynamics.

RESISTANCE OF ROTATING SUPERSONIC BODIES -- Shanghai, Shu-hsueh Lun-wen Chi (Mathematical Treatises), Shanghai Science and Technology Press, May 60, 488 pp

[The following is an abstract of an article, "The Minimum Resistance Problem for Rotating Bodies at Supersonic Velocities," by Liu Chao-jung (2692/0340/2837), Su Yuan-sheng (5685/6678/3932), and Hsieh Shou-hsin (6200/1108/9515), all of the Mathematics Department, Fudan University.]

In 1950, A. A. Nikol'skiy applied a variational method of solution to the problem of determining minimum resistance of a rotating body at supersonic velocities. Yu. D. Shmyglevskiy provided a theoretical solution for this problem in 1956 for cases in which shock waves were not produced; in 1958, he solved the problem of minimum resistance for plane airfoils when shock waves were produced. This paper deals with the problem of minimum resistance, for rotating bodies when shock waves are produced.

The following is a full translation of the Russian-language article, "Essential Components of the Set of Fixed Points, and Their Application to the Theory of Games," written by Chiang Chia-ho (3068/0857/4421) of the Mathematics Institute of the Chinese Academy of Sciences. The article was received for publication on 25 December 1962./

1. Let  $X$  be a compact metric space with distance  $d$ , and  $C(X)$  a complete metric space, consisting of all upper semicontinuous multiple-valued mappings of the space  $X$  into itself, having at least one fixed point with the general distance

$$\rho(f, g) = \sup_{x \in X} d(f(x), g(x)) \quad (f, g \in C(X)) \quad (\text{cf Source 1})$$

Let  $F(f)$  denote a set of all fixed points of the mapping  $f \in C(X)$ . Let  $C_0 \subset C(X)$  be any subspace. We shall say that the component  $\mathcal{G}(f)$  of the set  $F(f)$  (corresponding to the fixed point  $x$  of the mapping  $f$ ) is essential with respect to  $C_0$ , if to each open set  $U$  containing  $\mathcal{G}(f)$  (corresponding to the contained  $x$ ) it is possible to select  $\delta > 0$ , such that for any mapping  $g \in C_0$  which satisfies  $\rho(f, g) < \delta$ , there is at least one fixed point of the mapping  $g$  in the set  $U$ .

2. Let us assume again that  $X$  is a compact convex subset of the normalized space. Let  $C_0$  denote the set of all upper semicontinuous multiple-valued convex mappings of the space  $X$  into itself. The  $C_0 \subset C(X)$  according to Glicksberg's fixed point theorem, (cf Source 2)

Our basic result is the following:

Theorem 1: For any mapping  $f \in C_0$ ,  $F(f)$  has at least one component, essential with respect to  $C_0$ .

Corollary 1: Any mapping  $f \in C_0$  has at least one fixed point, essential with respect to  $C_0$ , if and only if  $F(f)$  is completely disjoint.

3. Let us examine the [noncooperative] continuous game  $\Gamma = \langle I, \{S_i\}_{i \in I}, \{H_i\}_{i \in I} \rangle$  of several persons over the unique n-cube, where  $I = \{1, \dots, n\}$  is the set of players;  $S_i = [0, 1]$  ( $i \in I$ ) is an infinite set of pure strategies of the player "i"; and  $H_i(x) = H_i(x_1, \dots, x_n)$  ( $i \in I$ ) is the winning of the game by "i" under the pure situation  $x = (x_1, \dots, x_n) \in S = S_1 \times \dots \times S_n$ . Let us assume that the real functions  $H_i$  ( $i \in I$ ) are continuous in the unique n-cube  $S$ . In all our following considerations,  $I$  and  $S_i$  ( $i \in I$ ) are maintained fixed. Therefore, the game  $\Gamma$  is determined completely by the aggregate of  $n$  functions of  $\{H_i\}_{i \in I}$ .  $\Gamma_n$  denotes the game  $\Gamma$  with  $\{H_i\}_{i \in I}$ . Let  $\mathcal{G}$  be a complete metric space, composed of all such games, with the distance

$$D(\Gamma_n, \Gamma_m) = \sum_{i \in I} \sup_{x \in S} |H_i(x) - G_i(x)|, \\ (\Gamma_n, \Gamma_m \in \mathcal{G}).$$

Let  $S_i^*$  ( $i \in I$ ) denote the set of mixed strategies of the player "i", which set comprises all distributions of probabilities in  $S_i = [0, 1]$ . Then the set  $S^* = S_1^* \times \dots \times S_n^*$  of mixed situations may be considered the compact convex subset of a certain normalized space (cf Source 4). Now let  $E(\Gamma) = S^*$  denote the set of all equilibrium situations in the game  $\Gamma \in \mathcal{G}$ . We shall say that the component  $\mathcal{E}(\Gamma)$  of the set  $E(\Gamma)$  (corresponding to the equilibrium situation  $p$  of game  $\Gamma$ ) is essential, if for each open set  $U$ , containing  $\mathcal{E}(\Gamma)$  (corresponding to the contained  $p$ ) it is possible to select  $\delta > 0$ , such that for any game  $\Gamma' \in \mathcal{G}$ , satisfying  $D(\Gamma, \Gamma') < \delta$ , there is at least one equilibrium situation of the game  $\Gamma'$  in the set  $U$ .

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Thus, on the basis of Theorem 1 and the interrelationship between the games  $\Gamma$  and their Nash mappings  $f_\Gamma$  (cf. Source 4), we obtain the following:

Theorem 2: For any game  $\Gamma \in \mathcal{G}$ ,  $E(\Gamma)$  has at least one essential component.

Corollary 2: Any game  $\Gamma \in \mathcal{G}$  has at least one essential equilibrium situation, if and only if  $E(\Gamma)$  is completely disjoint.

By analogy, we also obtain corresponding results when introducing the concept of essential components of the set of equilibrium situations for noncooperative finite games with several persons.

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MISCELLANEOUS

CHINESE SCIENCE CANDIDATES IN USSR PRESENT DISSERTATIONS -- Moscow, Vestnik Akademii Nauk SSSR, No 4, Apr 63, pp 119-135

Twenty-three science candidates from the People's Republic of China successfully presented dissertations in 1962 in the various departments of the Academy of Sciences USSR.

The scientists, with the corresponding school, are alphabetically listed below within the appropriate one of six major categories. Titles of the dissertations, here omitted, are listed in the source.

CANDIDATE OF PHYSICOMATHEMATICAL SCIENCES:

1. CHANG Kuang-yin (Physicotechnical Institute imeni A. F. Ioffe)
2. LIU Shen-ch'uan (Mathematics Institute imeni V. A. Steklov)
3. T'ENG Chi-wen (Institute of Physics of the Earth imeni O. Yu. Shmidt)
4. WANG Ju-ch'uan (Mathematics Institute imeni V. A. Steklov)

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3. WU Pang-yuan (Institute of Organoelemental Compounds)
4. YANG Che-min (Institute of Organic Chemistry imeni N. D. Zelinskiy)
5. YAO K'o-ming (Institute of Geochemistry and Analytical Chemistry imeni V. I. Vernadskiy)

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2. SHIH Yang-shen (Institute of Geology)
3. YANG Chi-tuan (Institute of Geology)

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1. HUANG Hung-shu (Institute of Plant Physiology)
2. LIU Chin-ho (Institute of Botany)
3. TS'AI Hsu-yu (Institute of Zoology)
4. SHAN Lun (Institute of Plant Physiology)
5. WANG Kuo-hsiung (Institute of Microbiology)
6. WANG Te-hsuan (Institute of Genetics)
7. WEI Chien-ch'un (Institute of Botany)

VIETNAMESE MATHEMATICIAN RETURNS HOME -- Peiping, Jen-min Jih-pao, 21 Apr 63, p 4

Vietnamese mathematician Hoang Tuy, who has been visiting China and lecturing in accordance with the 1963 implementation plan of the Sino-Vietnamese Cultural Cooperation Agreement, departed for Vietnam by train on 19 April.

EXHIBITION OF DANISH ELECTRONIC INSTRUMENTS OPENS IN PEIPING -- Peiping, Kuang-ming Jih-pao, 7 May 63, p 3

An exhibition of Danish electronic measuring instruments opened in the Peiping Exhibition Hall on 6 May. Vice-Chairman Chi Ch'ao-ting (p370/2600/7844) of the Chinese Committee for the Promotion of International Trade, Deputy Director Sung Chih-kuang (1345/0037/0342) of the

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West Europeans Affairs Department, Ministry of Foreign Affairs, Director Ch'en Ming (7115/2494) of the Third Bureau, Ministry of Foreign Trade, as well as other responsible persons and specialists concerned took part in the opening ceremony.

Both Vice-Chairman Chi Ch'ao-ting and the Danish ambassador spoke at the ceremony and expressed wishes for the success of the exhibition.

GROUP FROM CHINESE ACADEMY OF SCIENCES VISITS CUBA -- Peiping, Jen-min Jih-pao, 21 Apr 63, p 4

On 20 April, a group of six members of the Chinese Academy of Sciences, led by Lin Jung (2651/3579), deputy chairman of the Department of Biological Sciences, left Peiping by air for Havana. They will visit Cuba at the invitation of the Cuban Academy of Sciences.

MINISTER GUEVARA RECEIVES CHINESE VISITORS -- Peiping, Jen-min Jih-pao, 6 May 63, p 3

On 3 May, Cuban Minister of Industry Guevara received a group of scientists from the Chinese Academy of Sciences led by Lin Jung (2651/3579). Also present during the interview were Nunez Jimenez, president of the Cuban Academy of Sciences, and Chinese Ambassador to Cuba Shen Chien (3947/0256).

This group of scientist visited Cuba at the invitation of the Cuban Academy of Sciences, took part in the Cuban May Day celebrations, and inspected Cuban scientific research and educational institutions. They also relivered status reports on the development of Chinese science at the Cuban Academy of Sciences and Havana University.

CHINESE SCIENTIFIC DELEGATION ARRIVES IN MALI -- Peiping, Jen-min Jih-pao, 24 Apr 63, p 5

On the evening of 21 April, a delegation from the Chinese Scientific and Technical Association arrived in Bamako, the capital of Mali, for a friendly visit. The delegation is composed of three persons: Prof Ts'ai Hsi-t'ao (5591/1585/7118), a botanist; Prof Ch'en Feng-huai (7115/1409/2037), also a botanist; and Shang P'ei-ken (1424/1014/2704), a pharmacologist. Before their arrival at Bamako, the delegation had visited Ghana for a month.

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CHINESE SCIENTIFIC AND TECHNICAL DELEGATION ARRIVES IN GUINEA -- Peiping, Jen-min Jih-pao, 4 May 63, p 4

On 3 May, the Chinese Scientific and Technical Association delegation led by Ts'ai Hsi-t'ao (5591/1585/7118) concluded a 13 day visit to Mali, and left Bamako for Conakry, the capital of Guinea. On the evening of 1 May, the Chinese Ambassador to Mali held a reception for the scientific and technical delegation. Attending were more than 30 persons including the Mali Ministers of Justice, Development, and Health.

SHANGHAI HOLDS SCIENCE FILM FESTIVAL -- Peiping, Kuang-ming Jih-pao, 17 Mar 63, p 2

On 14 March, the Shanghai Municipal Film Bureau and the Shanghai Municipal Scientific and Technical Society sponsored a science film festival. Seven groups of films consisting of 18 separate films are being shown in 20 movie houses throughout the city, the purpose being to popularize science through films. The films were produced by the Shanghai Science Film Studio. The first group consists of "Wise Old Man," "China's War Skills," and "Typhoon." The second group consists of "Prepare Against Myopia" and "A Rare Man." The third group consists of "The Small Gold Wasp and the Pink Dollworm," "Protection and Care of Draft Cattle," and "Science Shorts." The fourth group consists of "Plant Skillfully and Harvest Much" and "Battle in the Pine Forests." The fifth group consists of "Fun With a Lathe," "Skillfully use corner Waste Spree," and "Oblique Surface." The sixth group consists of "Stone Woven Cloth," "Skillful Tailor," and "Science Shorts." The seventh group consists of "Strange Mountain Peaks and Caves" and "Picture of Jen Po-nien."



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BIOGRAPHIC INFORMATION

[The following biographic information on selected Chinese Communist scientific and technical personnel was taken from sources cited in parentheses.]

CH'ANG Hsi, Moscow Institute of the Petrochemical and Gas Industry imeni I. M. Gubkin; author of dissertation for the scientific degree of Candidate of Geological-Mineralogical Sciences, "Increased Effectiveness in the Study of Sections of Gas and Petroleum Wells by Neutron Methods," in Russian. (Moscow, Vechernyaya Moskva, 25 Apr 63, p 4)

CHANG Hsin-mo; coauthor with I. B. Chekmarev of article, "Laminar Boundary Layer in Electrolytic Solution in the Presence of Crossed Magnetic and Electric Fields," in Russian; received for publication 15 October 1962. (Moscow, Zhurnal Prikladnaya Mekhaniki i Tekhnicheskoy Fiziki, No 2, Mar-Apr 63, pp 151-153)

CHANG Jui-k'un, Physics Institute imeni P. N. Lebedev; author of dissertation for the scientific degree of Candidate of Physicomathematical Sciences, "Investigation of Bound States in the System Barion-Antibarion Using Green's Function," in Russian. (Moscow, Vechernyaya Moskva, 25 Apr 63, p 4)

CHAO Tse-san, Moscow State University; author of article, "Some Data of Mineral Particle Electricity During Blowing With Respect to Their Composition and Dispersion," in Russian; received for publication 21 May 62. (Moscow, Vestnik Moskovskogo Universiteta, Seriya 4, Geologiya, No 2, Mar-Apr 63, pp 61-65)

CH'EN I-hsien, Moscow Technological Institute of the Food Industry; author of dissertation for the scientific degree of Candidate of Technical Sciences, "Crystallization Rate in Low-Quality Sugar," in Russian. (Moscow, Vechernyaya Moskva, 15 Apr 63, p 4)

CH'EN Ling-yen, Joint Institute of Nuclear Research, Dubna; coauthor with L. B. Pikel'ner, M. I. Pshitula, Kim Hi-san, and Ye. I. Sharapov of article, "Liquid Scintillation ( $n - \gamma$ )-Detector," in Russian; received for publication 20 April 1962. (Moscow, Priroda i Tekhnika Eksperimenta, No 2, Mar-Apr 63, pp 48-50)

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CHENG Cheng-t'ung, coauthor with N. V. Lebedev of article, "Reason for Varied Quality of Roe in Certain Fish," in Russian; first published in Zoologicheskii Zhurnal, Volume 42, Number 2, 1963, pages 256-267. (Moscow, Ietopis' Zhurnal'nykh Statey, No 16, 13 Apr 63, p 54)

CH'ENG Erh-ch'ang, Moscow Machine Tool Instrument Institute; author of dissertation for the scientific degree of Candidate of Technical Sciences "Investigation of Vibroinsulation of Grinding Machines," in Russian. (Moscow, Vechernyaya Moskva, 15 Apr 63, p 4)

CHENG Yu-lung, Moscow Institute of Steel and Alloys; author of dissertation for the scientific degree of Candidate of Technical Sciences, "Study on the Flotation of Calcium Minerals and on the Action Mechanism of Certain Flotation Agents," in Russian. (Moscow, Vechernyaya Moskva, 25 Apr 63, p 4)

CHIANG Yen-yin (3068/4282/0936); author of a survey article, "The Situation of Research on the Chemistry of Rare-Earth Metal Ferrite Crystal Formation." (Peiping, Hua-hsueh T'ung-pao, No 12, Dec 62, pp 13-18)

CH'IN Ch'ing-huang, Moscow State University; author of dissertation for the scientific degree of Candidate of Geological-Mineralogical Sciences, "Lithologic-Geochemical Features of Mesozoic and Lower Paleogene Deposits in the Fergana Hollow," in Russian. (Moscow, Vechernyaya Moskva, 25 Apr 63, p 4)

CH'IU Hsiao-p'ei, Moscow Institute of the Petrochemical and Gas Industry imeni I. M. Gubkin; author of dissertation for the scientific degree of Candidate of Chemical Sciences, "Catalytic Polymerization of Mono-vinyl- and Allyl-Derivatives of Silicon," in Russian. (Moscow, Vechernyaya Moskva, 25 Apr 63, p 4)

CHOU Heng-chin, coauthor with Ye. B. Sokolov and M. P. Shebanov of article, "Synthesis of Ferrocene Analogs," in Russian. (Moscow, Zhurnal Obshchey Khimii, Vol 33, No 1, Jan 63, pp 217-220)

FAN Fu-k'ang, Institute of the Chemistry of Silicates, Academy of Sciences USSR; coauthor with A. K. Kuznetsov and E. K. Keler of article, "Phase Relations in the System  $Y_2O_3$ - $ZrO_2$  : 2. Solid Solutions," in Russian; received for publication 20 August 1962. (Moscow, Izvestiya Akademii Nauk SSSR, Otdeleniye Khimicheskikh Nauk, No 4, Apr 63, pp 601-610)

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FAN Mei-kung (2868/5019/0361); author of an article reviewing the literature on "Regulated Polymerizing Reactions of Olefines and Alcohols; Fan acknowledges the assistance of Prof Chiang Ming-ch'ien (5592/2494/6197). (Peiping, Hua-hsueh T'ung-pao, No 12, Dec 62, pp 19-24)

FU Ch'i-chung, Institute of Mineral Fuels, USSR; author of dissertation for the scientific degree of Candidate of Technical Sciences, "Investigation of the Process of Pyrolysis of Granular Coal With a Stable Heat-Carrying Agent," in Russian. (Moscow, Vechernyaya Moskva, 5 Apr 63, p 4)

HSIAO Li, Institute of Biological and Medical Chemistry, Academy of Medical Sciences USSR; author of dissertation for the scientific degree of Candidate of Medical Sciences, "Effect of the Role of Adrenocorticotrophic Hormone and Restored Triphosphopyridennucleotide on the Biosynthesis of Androgens and Corticosteroids," in Russian. (Moscow, Vechernyaya Moskva, 16 Apr 63, p 4)

HSIAH Hun-han, Moscow Higher Technical School imeni N. E. Bauman; author of article, "Setting Up of Automatic Machine Tools for Serial Production," in Russian; received for publication 24 June 1961. (Moscow, Izvestiya Vysshikh Uchebnykh Zavedeniy, Mashinostroyeniye, No 12, 1962, publication date, 26 Mar 63)

HSIN Chieh-liu (1823/0094/0362), professor, Biology Department, Fudan University; author of an article, "New Types of Insecticides." (Shanghai, K'o-hsueh Hua-pao, No 11, Nov 62, pp 403-404) (FOR OFFICIAL USE ONLY)

HSU Kuo-ch'ing, Moscow State University; author of dissertation for the scientific degree of Candidate of Geological-Mineralogical Sciences, "Conditions for the Formation of the Karasun Polymetallic Deposits, and Geochemical Methods for Finding Blind Orebodies," in Russian. (Moscow, Vechernyaya Moskva, 26 Mar 63, p 4)

HSU Lung-tao, Physics Institute imeni P. N. Lebedev; author of dissertation for the scientific degree of Candidate of Physicomathematical Sciences, "Behavior of Superconductors in a Magnetic Field," in Russian. (Moscow, Vechernyaya Moskva, 25 Apr 63, p 4)

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HSUEH Yu-hua, coauthor with Yu. B. Kudryashov and Ye. N. Goncharenko of article, "On the Effect of Oxidized Oleic Acid Upon the Amount of Blood Cells and Upon a Change in Rat Erythrogram," in Russian; received for publication 2 June 1962. (Moscow, Nauchnyye Doklady Vysshey Shkoly, Biologicheskkiye Nauki, No 2, 5 Apr 63, pp 109-114)

HU Jung-ting, Institute of Mineral Fuels, USSR; author of dissertation for the scientific degree of Candidate of Technical Sciences, "Thermal Decomposition of Fu-shun Liptobiolite," in Russian. (Moscow, Vechernyaya Moskva, 5 Apr 63, p 4)

HU Tsung-ting, coauthor with N. M. Karavayev of article, "Semicoking of Coal in an Experimental Furnace With Direct-Flow Multiple Circulation of the Heat-Carrying Agent," in Russian; received for publication 17 November 1962. (Moscow, Izvestiya Akademii Nauk, Otdeleniye Energetika i Transport, No 2, Mar-Apr 63, pp 233-237)

HUANG Kuan-lin, Moscow State University; author of dissertation for the scientific degree of Candidate of Chemical Sciences, "Radiational-Chemical Conversions in Concentrated Aqueous Solutions of Sulfuric Acid," in Russian. (Moscow, Vechernyaya Moskva, 15 Apr 63, p 4)

HUANG Mei-yuan, author of article, "Microstructure of Cumuli," in Russian. (Moscow, Izvestiya Akademii Nauk SSSR, Seriya Geofizika, No 2, Feb 63, pp 362-376)

JEN Chia-lieh, Kiev Polytechnic Institute; author of dissertation for the scientific degree of Candidate of Technical Sciences, "Investigation of the Automatic Welding of Austenitic Steels in a Nitrogen Medium," in Russian. (Kiev, Pravda Ukrainy, 5 Apr 63, p 4)

KO Chih-ming, Institute of Metallurgy imeni A. A. Baykov; author of dissertation for the scientific degree of Candidate of Technical Sciences, "Investigation of the Equilibrium Diagram for the Quaternary System Titanium-Aluminum-Molybdenum-Vanadium," in Russian. (Moscow, Vechernyaya Moskva, 16 Apr 63, p 4)

KUNG Kuo-yuan, Moscow State University; author of dissertation for the scientific degree of Candidate of Geographical Sciences, "Formation of Meanders," in Russian. (Moscow, Vechernyaya Moskva, 10 Apr 63, p 4)

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LIN Te-yu, Moscow Institute of Radioelectronics and Mining Electromechanics; author of dissertation for the scientific degree of Candidate of Technical Sciences, "Analysis of the Possibilities of Regulating the Crushing of Rock Through Explosion," in Russian. (Moscow, Vechernyaya Moskva, 16 Apr 63, p 4)

LIU Yu-ming (0491/6877/6900)  
HUNG Jui-hsiang (3163/3843/4382)

Both of the Shanghai Institute of Chemical Engineering; coauthors of an article, "Radiation Chemistry and the Inorganic Chemical Industry." (Shanghai, K'o-hsueh Hua-pao, No 11, Nov 62, pp 401-402)  
(FOR OFFICIAL USE ONLY)

MA Ch'ai-kuei; coauthor with V. K. Sirotko of article, "Phase-sensitive Organ Using the Hall Effect," in Russian; received for publication 19 June 1962. (Moscow, Izvestiya Akademii Nauk SSSR, Otdeleniye Tekhnicheskikh Nauk, Energetika i Transport, No 2, Mar-Apr 63, pp 193-198)

MA Ts'ang-wen, Engineer, Moscow Power Engineering Institute; coauthor with N. G. Rassokhin and V. N. Mel'nikov of article, "Heat Emission During Surface Boiling in Narrow Ring Channels," in Russian. (Moscow, Teplo-energetika, No 5, May 63, pp 56-60)

SHIH Hsi-kiuei (0670/6932/1145), Shanghai Institute of Agricultural Machinery; author of an article, "Electric Warming of the Soil." (Shanghai, K'o-hsueh Hua-pao, No 11, Nov 62, pp 412-413) (FOR OFFICIAL USE ONLY)

TA Ching-teng, State Central Institute of Physical Culture; author of dissertation for the scientific degree of Candidate of Pedagogical Sciences, "Effect of General Physical Training on the Cardiovascular System of Elderly Persons, According to Ballistocardiographic Data," in Russian. (Moscow, Vechernyaya Moskva, 18 Apr 63, p 4)

TAI Hsiung-tse, Kiev Polytechnic Institute; author of dissertation for the scientific degree of Candidate of Technical Sciences, "Investigation of the Surface Quality of Stainless Steel During Face Milling," in Russian. (Kiev, Pravda Ukrainy, 18 Apr 63, p 4)

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TENG Feng-hsiang, Moscow Institute of Steel and Alloys; author of dissertation for the scientific degree of Candidate of Technical Sciences, "Investigation of Certain Solid Alloys in the System Boron-Silicon-Carbon," in Russian. (Moscow, Vechernyaya Moskva, 25 Apr 63, p 4)

T'U Shan-chieh, Leningrad State University; coauthor with L. P. Strakhov of article, "Instrument for Measuring Magnetic Susceptibility," in Russian; received for publication 15 May 62. (Moscow, Priboiy i Tekhnika Eksperimenta, No 2, Mar-Apr 63, pp 145-150)

WANG Chi-shou (3769/4480/1108)  
LI Wei-wen (2521/1550/5730)

Both wrote articles discussing problems in the nomenclature of organophosphorus chemistry. (Peiping, Hua-hsueh T'ung-pao, No 12, Dec 62, pp 58-62)

WANG Ch'eng-ho, Moscow Machine Tool Instrument Institute; author of dissertation for the scientific degree of Candidate of Technical Sciences, "Comparative Analysis of Programming Systems for Metal-Cutting Machines," in Russian. (Moscow, Vechernyaya Moskva, 15 Apr 63, p 4)

WANG T'ao, Moscow Institute of the Petrochemical and Gas Industry imeni I. M. Gubkin; author of dissertation for the scientific degree of Candidate of Geological-Mineralogical Sciences, "Geological Conditions for the Formation and Disposition of Petroleum and Gas Accumulations in the Eastern Stavropol' Area," in Russian. (Moscow, Vechernyaya Moskva, 25 Apr 63, p 4)

WU Chin-hsiu, Moscow Geological Prospecting Institute imeni S. Ordzhonikidze; author of dissertation for the scientific degree of Candidate of Geological-Mineralogical Sciences, "Methodology of Engineering Geological Investigation for Designing Canals in Loess Rocks," in Russian. (Moscow, Vechernyaya Moskva, 17 Apr 63, p 4)

YU Chin-yen, Moscow State University; author of dissertation for the scientific degree of Candidate of Biological Sciences, "Regime of Moisture Content and Certain Properties of Basic Soil Differences in Light-Chestnut Complex for Forest Planting and Arable Land," in Russian. (Moscow, Vechernyaya Moskva, 17 Apr 63, p 4)

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Washington, DC 20505

7 September 2004

Ms. Roberta Schoen  
Deputy Director for Operations  
Defense Technical Information Center  
7725 John J. Kingman Road  
Suite 0944  
Ft. Belvoir, VA 22060

Dear Ms. Schoen:

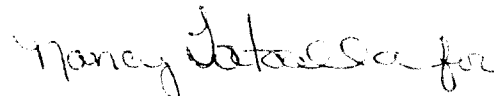
In February of this year, DTIC provided the CIA Declassification Center with a referral list of CIA documents held in the DTIC library. This referral was a follow on to the list of National Intelligence Surveys provided earlier in the year.

We have completed a declassification review of the "Non-NIS" referral list and include the results of that review as Enclosure 1. Of the 220 documents identified in our declassification database, only three are classified. These three are in the Release in Part category and may be released to the public once specified portions of the documents are removed. Sanitization instructions for these documents are included with Enclosure 1.

In addition to the documents addressed in Enclosure 1, 14 other documents were unable to be identified. DTIC then provided the CDC with hard copies of these documents in April 2004 for declassification review. The results of this review are provided as Enclosure 2.

We at CIA greatly appreciate your cooperation in this matter. Should you have any questions concerning this letter and for coordination of any further developments, please contact Donald Black of this office at (703) 613-1415.

Sincerely,



Sergio N. Alcivar  
Chief, CIA Declassification Center,  
Declassification Review and Referral  
Branch

Enclosures:

1. Declassification Review of CIA Documents at DTIC (with sanitization instructions for 3 documents)
2. Declassification Status of CIA Documents (hard copy) Referred by DTIC (with review processing sheets for each document)



## Processing of OGA-Held CIA Documents

The following CIA documents located at DTIC were reviewed  
by CIA and declassification guidance has been provided.

OGA Doc ID	Job Num	Box	Fldr	Doc	Doc ID	Document Title	Pub Date	Pages	Decision	Proc Date
AD0335308	78-03117A	194	1	23	4363	Scientific Information Report Chemistry And Metallurgy (26)	3/7/1963	71	Approved For Release	3/25/2004
AD0335625	78-03117A	197	1	3	4460	Scientific Information Report Chemistry And Metallurgy (27)	4/4/1963	51	Approved For Release	3/25/2004
AD0336825	78-03117A	199	1	26	4562	Scientific Information Report Chemistry And Metallurgy (28)	5/9/1963	70	Approved For Release	3/25/2004
AD0332150	78-03117A	183	1	5	3916	Scientific Information Report Chinese Science (11)	10/4/1962	52	Approved For Release	3/29/2004
AD0332434	78-03117A	183	1	40	3951	Scientific Information Report Chinese Science (12)	10/19/1962	59	Approved For Release	3/29/2004
AD0332795	78-03117A	184	1	37	3988	Scientific Information Report Chinese Science (13)	11/5/1962	48	Approved For Release	3/29/2004
AD0333069	78-03117A	186	1	7	4028	Scientific Information Report Chinese Science (14)	11/16/1962	30	Approved For Release	3/29/2004
AD0333148	78-03117A	187	1	19	4078	Scientific Information Report Chinese Science (15)	11/29/1962	44	Approved For Release	3/29/2004
AD0333835	78-03117A	189	1	6	4144	Scientific Information Report Chinese Science (16)	12/21/1962	65	Approved For Release	3/29/2004
AD0334108	78-03117A	190	1	2	4179	Scientific Information Report Chinese Science (17)	1/10/1963	56	Approved For Release	3/29/2004
AD0334105	78-03117A	191	1	12	4230	Scientific Information Report Chinese Science (18)	1/18/1963	25	Approved For Release	3/29/2004
AD0334378	78-03117A	192	1	21	4277	Scientific Information Report Chinese Science (19)	2/1/1963	27	Approved For Release	3/29/2004
AD0334433	78-03117A	193	1	22	4322	Scientific Information Report Chinese Science (20)	2/15/1963	28	Approved For Release	3/29/2004
AD0335021	78-03117A	194	1	37	4377	Scientific Information Report Chinese Science (21)	3/8/1963	59	Approved For Release	3/29/2004
AD0335847	78-03117A	198	1	33	4526	Scientific Information Report Chinese Science (22)	4/18/1963	61	Approved For Release	3/29/2004
AD0336327	78-03117A	200	1	3	4578	Scientific Information Report Chinese Science (23)	5/2/1963	68	Approved For Release	3/29/2004
AD0337167	78-03117A	201	1	26	4643	Scientific Information Report Chinese Science (24)	5/23/1963	95	Approved For Release	3/29/2004
AD0337777	78-03117A	202	1	27	4687	Scientific Information Report Chinese Science (25)	6/6/1963	52	Approved For Release	3/29/2004
AD0338474	78-03117A	203	1	27	4727	Scientific Information Report Chinese Science (26)	6/20/1963	83	Approved For Release	3/29/2004
AD0338687	78-03117A	204	1	32	4772	Scientific Information Report Chinese Science (27)	7/5/1963	80	Approved For Release	3/29/2004
AD0339386	78-03117A	206	1	4	4820	Scientific Information Report Chinese Science (28)	7/17/1963	32	Approved For Release	3/29/2004
AD0339147	78-03117A	207	1	11	4862	Scientific Information Report Chinese Science (29)	7/30/1963	48	Approved For Release	3/29/2004
AD0340927	78-03117A	208	1	35	4924	Scientific Information Report Chinese Science (30)	8/21/1963	53	Approved For Release	3/29/2004
AD0341855	78-03117A	209	1	43	4974	Scientific Information Report Chinese Science (31)	9/5/1963	46	Approved For Release	3/29/2004
AD0342464	78-03117A	210	1	38	5013	Scientific Information Report Chinese Science (32)	9/16/1963	43	Approved For Release	3/29/2004
AD0342608	78-03117A	211	1	36	5054	Scientific Information Report Chinese Science (33)	9/27/1963	41	Approved For Release	3/29/2004